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ORIGINAL ARTICLES.

ON THE VALUE OF THE COMPARATIVE METHOD IN THE STUDY OF PATHOLOGY.[1]

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THE most pleasant, if at the same time the most trying, of the numerous duties which your by-laws entail upon your President is the preparation of an annual address, in which he shall set forth before you the recent progress of our art, or other matters of general professional interest which may prove, if not helpful, at least temporarily entertaining. As I have glanced over the annual addresses of my predecessors, and have noted the wide range of subjects considered by them, and have fully appreciated the value of their work and the eminence of their personalities, I have stood aghast at the task thus set for me. It may happen, however, to any earnest and faithful student of medical science who has made no brilliant discoveries of his own, and who has shown himself nothing more than a zealous traveller along pathways made for him by the feet of others, to view, as it were, regions into which as yet but few paths lead, or which have been untrodden as yet by the footfalls of his fellow-men. Into such regions he may yearn to explore, yet be without the necessary training or preparation. Yet, seeing these, he may sometimes do good by pointing out to others where their own explorations may be required and their time well spent. It must be in some such capacity, if at all, that I must serve you to-night.

I have, consequently, selected for the topic of my address a subject upon which I have at least reflected long and seriously, and have time and again yearned for light that either was not provided or was too obscurely hidden, and in such a way as to be concealed from easy appreciation. My plea, then, with you to-night is for a further extension of methods of comparative study in the investigation of disease and departure from the normal standard. Some such illustration, perhaps, as this may serve better to make known my meaning: There have been various methods devised of studying the languages, living and dead. An extreme in one direction has been to take the advanced grammar, and thus, beginning at the top of the linguistic ladder, gradually work down—a method by which even to-day too many young men waste their time over the study of Latin and Greek, as well as of French and German. The other method, the so-called natural method, has been to begin with the simplest parts of speech, to deduce grammatical rules as the scholar advances, and to carry him along by easy and progressive stages until, at the culmination of his studies, parts of speech and rules for their use come as naturally as do the words which are to be marshalled together into grammatical form. The introduction of methods like this has robbed the study of languages for the children of to-day of most of the terrors which they presented for the children of my generation. The same comparative methods are evident in all the best educational institutions, and are being constantly improved by the best educators. The tendency toward the comparative study of the various branches of science is perhaps happily illustrated in the recent appearance of a text-book on comparative geology (by Keyser). This, perhaps for the first time, does for geology what comparative study has accomplished for botany, zoology, etc. Most of the text-books on geology are confined to the geological phenomena of a single country, the rest of the world being dealt with in a very careless fashion. To be sure, this is in the main due to the fact that the writers worked within altogether too narrow limits, and have little or no personal acquaintance with conditions in countries which to them are foreign. Nevertheless, the key to the great geological problems of our earth is not to be found in any one region, but must be comprehensively viewed and studied. If, now, these methods be important in linguistic study, in geology, and in all the various branches where no one will deny their importance, how much more important are they for us in the study of the medical sciences! If we stop a moment to inquire why it is that this common-sense method of study, as all will allow it, has been so generally disregarded in the medical schools of the world, the answer will probably be found in the utilitarian view, held by many that the time is not sufficient to permit of beginning at the bottom and working up, and that after all it is dis-

[1] Being the President's Annual Address before the Medical Society of the State of New York.

Nulla autem est alli pro certo noscendi via, nisi quam plurimus, et morborum, et dissectionum historias tum aliorum, tum proprias collectus habere, et inter se comparare.—MORGAGNI.

ease in the human race rather than disease in the lower orders with which we are especially to concern ourselves. Potent as is this view in the minds of most, it nevertheless does not permit of full justice to the subject, and should not be permitted to stand in view of the really higher interests of medicine.

While a man may be perfectly competent to reduce a fracture of a fibula, and quickly put the patient upon his feet with a useful limb, who has never heard that the fibula is a disappearing relic, and that in many of the lower animals it is a larger bone, there nevertheless is no reason why in the interests of higher medical education this fact should not be perfectly familiar to him and to all. The man who removes an ovarian tumor successfully and conducts his patient through a speedy convalescence must certainly be considered a competent practitioner of his art, though he may have no comprehension of the peculiar findings within such a tumor, and may be as much at a loss to account for the teeth, the hair, the rudimentary mammary gland, or other structures which he may find there as the original possessor of the growth. Does it follow, however, that he can be considered a really educated man if he prove himself thus ignorant? The surgeon who exposes a dermoid tumor within the cavity of the cranium may have the technical skill by which to remove it and secure a primary wound-healing, and yet be utterly at a loss to account for its presence in that location. Is he to be content with his surgical skill, or are we to expect of him that he shall possess something more than this and be able to tell as much as anyone may know of the secret of such a growth?

I think you will all agree with me that such knowledge is most desirable, and that it really has a large degree of practical or utilitarian value. But how to get it and how to teach it is the great problem before us, and how to disseminate more widely the knowledge now possessed by a few is one of the tasks which the wise men of the present have to set themselves.

First of all, we cannot for one moment afford to lose sight of the fact that our bodies are but aggregations of cells, each of which has its own individuality, even to some extent its own autonomy. Every organized being is then a republic of cells, but it is not yet widely enough appreciated that, as in a republic of citizens, a little disturbance in one region may bring about by most unexpected agencies a disturbance or even a revolution, so in the bodies alike of plants and animals cellular disturbance at one point is sure to affect to greater or less extent the entire economy. In the higher animal and vegetable forms, however, the cellular organization is altogether too complex to permit of a study of the conditions which so disturb inter-relation of parts. If we are, then, to acquire any knowledge or idea as to what goes on within such wonderfully complex organisms as our own, we must begin by the study of those which are vastly simpler. In this connection I want to lay before you as a model in my estimation of what such study should mean the *Researches on Inflammations*, by that indefatigable Russian biologist, Metschnikoff, who has for some years been so prominent a figure in the Pasteur Institute in Paris. If there be any one phenomenon concerning which we need more positive and exact notions than another, it seems to be this very one of inflammation. The changes attending it in complex organisms are so complicated and give rise to such wide diversity of disturbance, tissue-alterations, and results, that we cannot afford to disregard one thing concerning it which may be gained from any source. Although this has been conceded for centuries, and although John Hunter appreciated the fact, and like many others worked long and arduously at the solution of some of its attendant problems, it was Metschnikoff who, more than any other living man, in my estimation, has made the process clear, simply because he began to study it in the lowest forms of living beings. To anyone who will read his fascinating work, the advantages of this method will be made so clearly apparent that he will wish that every pathological laboratory had its corps of Metschnikoffs in order to pursue work along the same general lines and by the same methods. But for our purposes and in various ways I would go even further than this. I would say that the beginning of all pathological processes, as of all physiological, should be studied in the vegetable kingdom first, where may be found the parallels of all those changes which go to constitute disease, even of complex type, in the human race. The elements of plant-physiology may be reasonably mastered within a comparatively short time without going too deeply into the principles of ontogeny and phylogeny; but if the circulation, for instance, is to be studied, it certainly can be best studied under conditions where it is most simple, and I would vastly prefer to see the student trained to know how the sap makes its way through the length and breadth of a tree before he begins to think of how the blood circulates through his own frame. It is better that he should work up to a knowledge of the circulation if his medical education is to be complete, than work down to the simple after having begun with the complex. After he has mastered the normal circulation in plants, he will then be in a position the better to appreciate what takes place when a plant is wounded, and he will learn to distinguish between the true hemorrhage of vegetable organisms and a true exudation, and the differences between mere outpour of vegetable juices due to

solution of continuity, and the pathological secretions which takes place when the parts have been irritated by parasites, exposure to injuries by vicissitudes of weather, or have had the character of their secretions materially, sometimes almost totally, altered by variation of surroundings, changes in soil, etc.

How much better, then, to begin studying the activities of cells in the lowest and most immature organisms first. If the study be begun in this way, it will be seen that the formative activity of cells dominates over their secretive activity, and it will be found, for instance, that those cells which have passed out of the gland as waste products may remain and proliferate more or less independently. This, by the way, may be a factor in explaining the genesis of cancer; *e. g.*, in the breast. It will be seen, too, that the behavior of cells as well often as of organs (composed of them) depends in large degree upon the quantity and quality of nutritive material which is at disposal. Thus, among the bees it depends upon the nutrition supplied to the female larva whether it shall remain a neuter or become a sexually perfect female.

There is one law, however, of cellular physiology which is apparently never violated, and that is, that a derivative of one germ-layer never by any chance develops a structure originally derived from another. Consequently after differentiation of the blastodermic membranes no wholly indefinite cells are formed. Those cells which are thereafter formed can develop only certain tissues. But all these cells are directed by some unseen force, even when they appear uncontrolled, and in a suitable environment will always tend to arrange themselves into the form of the organism from which they originated. Thus, a small detached bit of hydra soon moulds itself into the complete shape of the parent organism. The property of selective assimilation seems to be possessed by cells in common, and those of a given part appear to have the power of moulding adjacent material into cells after their own kind. This is shown by the fact that a tail is reproduced where there was a tail, and a leg, and only a leg, where there was a leg. These processes have been likened to those by which a crystal reproduces its lost apex when placed in a solution of identical material. The lower the animal or vegetable form the more complete is the power to reproduce the lost parts; the higher we ascend the scale the more limited does this become, until in man the ability to reproduce lost parts is almost completely gone, and when noted at all is seen only during the beginnings of life or its early stages, at a time when there is still more or less embryonic tissue which can functionate. Thus, during the early periods of embryonic life there may be more or less complete reproduction of fingers after injury, though nothing of the kind occurs in adults. There are cases on record of reproduction of supernumerary digits after amputation, which seems the more remarkable because the normal digits have no such power of regrowth, the nearest approach being the occasional appearance of imperfect nails on finger-stumps after amputation. Simpson several times noted that arms amputated *in utero* by bands grew again to a certain extent, while in one case the extremity was divided into three minute nodules, on two of which small points of nails could be detected. This is probably as far as attempts of this kind have ever been observed in our own species. In the same way in plants, adventitious buds, like adventitious fingers in the fœtus, differ from the normal only in respect to position. Such buds originate in the same way and have been found upon almost every part of plants. They sometimes develop in extraordinary numbers upon the stem and branches of trees owing to some interference with the vegetation of the normal buds. More easy adaptation of part to circumstance is, however, seen in the vegetable than in the animal kingdom. Du Hamel planted a willow with its branches in the ground and its roots in the air and saw the roots become covered with buds, while the budding branches produced roots. Adventitious buds may also be found on the petiole, lamina, and other parts of the leaf. Thus the bud, like the ovum, is to be regarded as an individual vital centre. Parthenogenesis, which never occurs in the animal kingdom, may be frequently seen in the vegetable, and buds apparently may arise where undifferentiated cells are present.

In either kingdom, however, so soon as cells begin to specialize they lose the primary general function or power of reproducing the entire organism, apparently because all of the original protoplasm has been specialized and used up. In the higher organisms certain cells never attain high development, but remain always in a lowly organized condition and serve either as germs for reproducing the entire individual or for forming and maintaining various tissues and organs, remaining, as it were, in reserve. Such cells are found in all growing organs and tissues, and, according to Williams, are the only real cancer- or tumor-germs. Most of the specialized cells of an organism produce only those which are incapable of acting as germs for an entire individual; *e. g.*, epithelium always produces epithelium.

Since much of what I have to say to-night pertains to the genesis of tumors, it may be worth while to reiterate Williams's views to the effect that every phenomenon of neoplastic growth has its counterpart in the normal processes of evolution, and that the better we understand the latter the better we shall appreciate the former. On the one

hand, there is continuous perfecting of bodily structure by differentiation; on the other, continuous transition from lower to higher types of development. Each individual reproduces in its own life the most important morphological changes through which its long line of ancestors has passed. In every act of reproduction a minute quantity of protoplasm is transferred from the producing to the produced offspring, and along with it the molecular condition peculiar to the parents; and upon this heredity depends. The persistence of impressions, or what has been called unconscious memory in protoplasm, is the property upon which, in ultimate analysis, the phenomena of heredity will be found to depend. Organisms which have undergone impressions under new conditions tend to return to the original structure or habits when restored to original surroundings. When we seek for the influence most potent to produce variation in protoplasm, we must agree with Darwin, who says: "Of all the causes which induce variability, excess of food, whether or not changed in nature, is probably the most powerful." Viewed in this light, the sudden development of a neoplasm in an otherwise healthy organism is the outcome of gradual and continuous changes in the evolution of the cells of the affected part, owing to minute and as yet unrecognizable changes in the nutrition of the cells. Regard for a moment the effect of too much or too little nourishment. Young trees, for instance, often remain sterile because of too rich soil and too much excess of fluids; while too warm a temperature hastens the second sprouting, the necessary juices are kept away from the first, and fruit blossoms may be prevented from developing. Among the little insects known as plant-lice agamic multiplication continues throughout the summer if only external conditions—*i. e.*, weather and supply of nutrition—are favorable; but when the weather becomes cold and the supply of sap in the plant fails, fertilization of ova is again necessary.

But study vegetable pathology for a few moments, regarding plants as if they were animals and likening the sap to the circulating blood. Carrying out this analogy, the vegetable pathologists describe what they call ischæmia and even necrosis in plants, and show how these may occur from injury to the roots, from interference with circulation caused by grafting, from abusing the tree, from early frost, improper soil, etc. They show also the alteration in natural fluids in the presence of disease; and it is of some interest to know that the secretions of parts involved in necrotic or so-called cancerous changes contain gallic and humic acids. Furthermore, studying the effect of alterations in light and air, they describe conditions of plant life analogous to chlorosis and icterus, alleging perverted nutrition, usually in the direction of too much and too rich food with too abundant moisture as the causes of these conditions. They also describe what they call dry gangrene, while in the presence of stasis with decomposition of the fluids which should be circulating there is sufficient irritation with perversion of nutrition to influence cell-growth into the development of so-called cancer in trees.

In my estimation there is as much hope of getting light upon the vexed question of origin of tumors by the study of influences operating to produce them in plants and trees as from any other source. The influence of certain fungi in producing sclerotic changes in vegetable tissues is also very much in accord with what we know to result in animal tissues from the presence of parasites. There is, for instance, the peculiar fungus known as the peziza, which produces most extensive sclerotic changes, both internally and near the surface. The great beauty of studying disease in vegetable life is the abundance of material and the absence of sentiment concerning its utilization. A great deal of vegetable pathology is yet to be learned by the inoculation-method, since there is just as much possibility of deliberately infecting trees by artificial inoculation with various parasites, to them pathogenic, as there is in our pathological laboratories of infecting animals.

And here, by the way, the expert agriculturist or the student of scientific agriculture, horticulture, etc., in our agricultural colleges is a person whom the veterinarian and the human pathologist would do well to cultivate, since to such a one are known many facts of to him great practical importance, which yet have a significance reaching far beyond his environment and embodying general principles with which we ought to be equally familiar, although, sad to say, we seldom are. I often consider it a great pity that there are not societies where men in these various walks of life may get together and disseminate more widely a knowledge which physicians as such rarely, if ever, possess, but which could be by such communications made of great value.

For example, the reaction of vegetable tissue after wounds is even to physicians most instructive. If after bruising of a plant, for instance, the bruised portion be left *in situ* it decomposes easily, while the wound itself heals with difficulty or even not at all, and necrosis of surrounding tissue often follows. Is not this the exact counterpart of what one might say of wounds of the animal body? It is of passing interest even to remember that hailstones may produce injuries, contusions, etc., which shall materially affect the nutrition of a plant or tree, and that contused wounds made in this way may be followed by more or less disastrous results. There is also a difference between what we may call the bleeding of a tree and pathological secretion after certain injuries. The latter originates in and near the injured part;

the chemical nature of the secretion is altered, and a variety of materials, to us most useful, are in this way produced, although the causes have in but rare instances been studied out. For example, the various resinous materials, and such substances as tragacanth, manna, and other gums, are all pathological secretions produced in consequence of more or less specific irritations. Then, again, open wounds in trees give peculiar opportunity for microbic infection or that by other parasitic fungi, which, as a rule, cause necrosis of the plant- or wood-tissue. Such infections, however, in trees rarely spread widely, and the resulting necrosis is for the most part local. Only those products of decomposition which are soluble are diffused into surrounding tissues, where their influence may be injurious. Hemorrhage, so-called, in plants is the result of a fresh wound, the peculiar juices, sap, etc., exuding, possibly to an extent so serious as to lead to the death of the plant. The most damaging exudate, however, is that of gum from trees after their foilage is out; the reason for which is that the exudate exerts such pressure that there is stasis, and even coagulation of fluids between the cortex and the woody part of the tree, by which circulation is impeded. Again, it often happens, as the result of frostbite during foliage, that the cortex (bark) may rupture and permit escape of this coagulated secretion from the disturbed part. All of which only makes things worse, since there is now thrown out a still more irritating secretion (often spoken of by agriculturists as chilblains), which not seldom forms an open cancer upon the tree. In a minor way, pathological flow of gum is also produced by the stings of beetles, and of many other insects which lay their eggs in the cortex, the lesion then being strikingly analogous to that produced beneath an animal's skin by the sting of certain insects, etc.

Yet different is the peculiar yellowish, sticky, sweetish-tasting substance, of unpleasant odor, often seen upon the upper surface of the leaves and stems of many plants, where it may gather within a few hours. This is commonly spoken of as "honey-dew" (melligo). It is an abnormal secretion of certain plants whose juices are rich in sugar. It is most commonly found in the spring after sudden changes of temperature, escaping from the cells, through the pores, upon the surface of the plant, where, combining with the moisture of the atmosphere, especially during the cool of the night, it is precipitated upon the surface, thus closing the pores from which it has escaped, and interfering with their function as well as with the growth of the plant. This may be washed off during a severe rain; but if not removed by natural processes, is liable to ferment, it being quickly attacked by minute fungi. The benefit to infected trees and plants of severe rain and wind, which are thus destructive agents of these fungi and permit the re-establishment of normal vegetable function, is then most easily appreciated.

In plants and animals alike, the process of repair and the neoplastic tendency are closely allied, differing only in degree. The new growth of repair serves to replace that which has been lost; while that of neoplasms is indefinite and knows no bounds, the subordination of local processes to tissue-necessities and to specific hereditary tendencies having been lost.

The *formation of tumors in trees* seems to me a subject of very great interest. All the woody tumors have been grouped in a general way under the term "xylomata," while among some of the botanists they are indiscriminately called cancer. In the majority of cases the so-called cancers of plants occur around the sites of previous injury, where the natural process of healing has been interfered with, and where the cambium produces an abnormal amount of parenchyma instead of healthy wood. Lesions of vegetable tissue produced by frostbites are particularly liable to be followed by these xylomatous formations. They may also be produced by the stings of many of the small parasitic animals, like plant-lice. The pyrenomycetes are known to be the cause of some of the xylomata. In the populus tremulus, for example, the stems and branches often show tumors of varying, even of large, size, the hypertrophy commencing in the cortex, involving all or only part of a limb, being followed by swelling of the wood proper, and later perhaps by destruction of the cortex by frostbite, with exposure of the wood beneath, necrosis ensuing. The importance of the lesions produced by exposure to cold is not generally realized. It is, moreover, of peculiar interest that trees inoculated with cancerous sprouts or grafts become themselves cancerous (Lucas). Lorauer has described two forms of so-called cancer in the apple-tree, both of which seem to result from frostbite—one a rose-like growth with a necrotic centre surrounded by terrace-like edges, enlarging yearly; the other, a closed form of growth appearing upon branches, attaining a size three or four times that of the plant, with a funnel-like depression, the edges of the original lesion rolling in toward each other instead of diverging as in the previous case. Physicians are made familiar with a very limited number of these xylomata when they study the materia medica of the astringents, and are told about the origin of gallic acid. The student is informed that the nutgall is the result of irritation produced by an insect, and that perhaps at least one hundred species of gall are known upon the oak; but here his acquaintance with the xylomata ceases, and he is taught no far-reaching lesson from this fact in vegetable pathology.

Perhaps the most instructive animal-parasites of

trees and plants to watch and study are the so-called plant-lice, since they pass their whole lives upon plants and draw from them their nourishment. These little insects fasten upon the plant by suction, puncturing the part and producing an irritative action which is followed by a variety of lesions, from hypertrophy of irritated tissue to speedy necrosis. The hypertrophies may have the character of true galls. One form of plant-mildew indeed is produced by these same little animals, being in effect the empty sloughs which they leave behind and which remain as a white mass upon the green surface. These same plant-lice are the active agents in the production of certain tumors often spoken of as cancer. But it is especially the so-called blood-lice, which live in young plants and thrive best in fresh wounds, which lead to most marked neoplasms. The blood-louse is an almost motionless parasite, which attacks young plants upon wound-edges, where it finds the tissues thin enough to have ready access to the plant-juices. When this parasite has fastened, the cambium becomes more active and hypertrophied, while the plant-cells, being now exposed, absorb moisture and swell even to the point of bursting. By this means long, elliptical clefts are formed, and these often become the site of so-called cancers. It will thus be seen that nearly all, if not all, of the so-called xylomata are really of parasitic origin. It will not do, however, to argue too loosely from this fact that the same thing is true in the animal-world. We at least have not yet sufficient evidence to make so positive a statement.

The xylomata have been divided by Williams into three main groups:

A. Discontinuous or circumscribed growths, to which the vague name of "knaurs" should be restricted. This includes nodules so often met in the bark of common trees. These are usually rounded swellings in the deeper part of the bark, varying in size from a pin-head to a cocoanut, usually encapsulated, often with fibro-vascular pedicles connecting broader portions with the woody tissues of the trunk or stem. These on section consist of dense wood showing all the structural elements of the tissue from which they spring, only atypically arranged. Most of these tumors arise from disorderly growth of adventitious or dormant buds, which may remain in quiescent state for years and then develop renewed activity. These tumors may even be utilized for purposes of propagation, as in the case of buds of some species of apples, which produce both roots and leaves in abundance.

B. Continuous tumors, corresponding to exostoses in animals, presenting as woody outgrowths of the trunk or plant. They may attain great size, weighing fifty pounds or more. They seem to arise by excessive local cell-proliferation of the cambium.

C. Totally new growths, presenting a surface thickly studded with shoots and stunted branches. This is a combination, in fact, of exostosis with diffuse bud-formation—that is, of the preceding forms.

For the cellular pathologist, then, a tumor in an animal or upon a tree is practically the same, it making no difference even whether it occur upon the bark, upon the leaf, or anywhere, provided only that a previous pathological lesion has occurred. The nut-gall which arises in consequence of the puncture of an insect, the tuberous swellings which mark the spots on trees where boughs have been cut off, and the wall-like elevation which forms around the border of the wounded surface produced by cutting down a tree, and which ultimately covers in that surface, all of these depend upon proliferation of cells just as abundant, just as rapid, as that which we perceive in the growing tumor in the human body. The process in plants conforms practically to that in animals, both being of the same general type.

Malignancy of tumor-formation is largely a process of cell-degeneration and incompetence. When in animals it begins in mesoblastic connective tissue, the more imperfect the cell-development the more of the round-celled type it assumes in consequence. Hence the malignancy of sarcoma is to be judged of quite accurately by the roundness and incompleteness of its component cells. In benign tumors the reproduction of cells is more orderly, but is not in harmony with the demands of the rest of the system. The simplest of all the body-tissues is its fatty tissue, and fatty tumors are the most frequent of all benign growths; while true gland-tissue, which is most difficult to irritate, furnishes the smallest number. True cancer has been described most attractively as a "parody upon the gland-tissue;" and it certainly is a hideous travesty of its kind. It occurs most often in tissue which has outlived its usefulness, like the mamma, the uterus, etc.; and it is in such tissue, for the most part, that true carcinoma, or the so-called "rebellion of the cells," occurs (Hutchinson), while epitheliomata occur also in worn-out tissue, usually under the stimulus of some irritation. Epitheliomata are rare among the lower animals as compared with man, and when met with at all occur most often in the domesticated animals and those in confinement. Sarcomata are common in all classes of animals, from the fish upward; but even these are more common among those ordinarily domesticated. (Possibly this is only an apparent prevalence rather than a real, because of much greater familiarity with animals in domestication.) Carnivorous animals are more prone to malignant disease than are the herbivorous, while the reverse is true with regard to liability to tuberculosis. Cartilaginous tumors, particularly in the breast, are much more common in animals than in man. The quadrumana, however, manifest but

little disposition either to neoplasms or to tuberculosis.

In cancer atavism, or reversion to an earlier type, may be traced back to the hydroid stage, where simple fission is the prevailing method of multiplication; in consequence of which we have a longer-lived and more aggressive cell-growth, which we call malignant. If a mesoblastic cell be the ringleader instead of an epiblastic, we then have sarcoma with its less brilliant but more stable cellular achievements (Hutchinson).

These neoplasms are not peculiar, as will be seen and as has been seen, to man, nor even to animals, although it must be stated that epithelial neoplasms are of rare occurrence in the lower animals as compared with mankind, and that they are apparently more common among the domesticated than among wild animals. On the other hand, sarcomata have been met with in nearly all classes of animals, from fish upward, although these also occur most often among the domesticated. Dogs, horses, asses, and pigs are particularly liable to sarcoma of the testicle. Horses, especially those of light color, are most prone to melanotic sarcoma of the anal region. Horses are also quite often victims of psammoma in the brain. According to Rayer, carnivorous animals are more prone to malignant disease than herbivorous. The benign tumors, like fibroma, enchondroma, and osteoma, are almost as widely diffused as sarcoma. Fatty tumors are frequently seen in domesticated animals. Mammary fibro-adenoma among dogs and cats is fairly common, and chondroma of the mammary gland is much more frequent among animals than among man. Cystic ovaries are also common in the domestic animals.

(To be concluded.)

POST-MORTEM CÆSAREAN SECTION, WITH DELIVERY OF A LIVING CHILD.

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SUDDEN death of the mother during labor, if the child is living, makes it obligatory upon the attending physician to endeavor to rescue the infant. The success of such an attempt will depend, first, upon the nature of the cause which destroys the life of the mother; second, upon the time chosen for the delivery; and, third, upon the method employed.

Two causes of maternal death are especially fatal to the fœtus. One is traumatism, resulting in severe hemorrhage to the mother, and the other is an infection, producing high fever and profound intoxication. Sudden death in labor from heart-lesions or from mechanical injury, without great hemorrhage, gives conditions most favorable for the survival of the child.

The time for accomplishing delivery in these cases is necessarily brief. A recent case is reported by Hoffman[1] in which in an eclamptic patient he describes the delivery of a living child by abdominal and uterine incision ten minutes after the mother had ceased to breathe. It may scarcely be supposed that a longer delay than this could be borne by the fœtus. Where high temperature is present, the time must be necessarily briefer in which successful delivery may be accomplished.

The method of performing rapid delivery in these cases has been variously chosen by different operators; while abdominal and uterine incision is undoubtedly quickest, some prefer forcible dilatation of the uterus, and forceps or version. The practical choice of a method must depend upon the condition of the birth-canal, and also the circumstances and situation of the patient. Where abundant assistance is at hand, the patient can quickly be put in suitable posture for the forceps or version. Where, however, but little help can be obtained, and the patient cannot be placed in proper position readily, it is often more easy to perform abdominal incision.

The survival of children so delivered will depend upon the vigor of the child, and also upon the nature of the cause which destroyed the mother's life. The acute infections are especially fatal to infants, not only from the action of poisonous germs conveyed from mother to child, but also by reason of the high temperature which is often present in these cases.

A recent case may serve to illustrate the foregoing remarks:

The patient, Mrs. L., aged twenty-six years, a primipara, had been in good health during her pregnancy. She was of good constitution, and had always enjoyed excellent health. A few days before her death she had summoned her physician with the complaint of headache, restlessness, and nervous discomfort. He prescribed a sedative for her which somewhat relieved her symptoms. Shortly afterward, while sitting with her family, she was suddenly seized with convulsions, and soon became unconscious. Her physician was at once summoned, and applied the usual methods of treatment for subduing the eclamptic seizures. These were, however, unsuccessful, and the patient rapidly passed into a comatose condition with extensive œdema of the lungs. I saw her in consultation about six hours after the first attack. She was then in deep coma, with a high temperature and labored breathing. Vaginal examination disclosed the membranes un-

[1] Centralblatt für Gynäkologie, 1895, No. 50.

ruptured, the cervix obliterated, and the os about three-fourths dilated. It seemed to me possible to rupture the membranes, complete dilatation with the hand, and apply forceps, as the vertex was presenting. While hastily preparing the forceps, the patient was seized with a convulsion, at the close of which she expired. I hurriedly asked whether the family desired that an effort be made to save the child, and was informed that such was their wish. As the patient was a large, stout woman, and her bed so placed that she could not be put into position for the use of forceps without considerable difficulty, the quickest method of delivery seemed abdominal incision. Accordingly, while one of the physicians held a light, the abdomen and uterus were rapidly opened, and a male child, weighing 7 pounds and 12 ounces, was extracted. In the hurry of the moment, the patient's temperature had not been taken, but her body felt so hot to the hand that her temperature must have been above 104°. The child was asphyxiated, but speedily revived and breathed naturally. As the child would be without skilled care if left at home, he was immediately warmly wrapped, placed between warmed pillows, and taken to the Jefferson Maternity, where he was placed in an incubator. He was nursed by a healthy young woman whose child was but a few days old, and was given the faithful care of trained nurses. It was observed that the child perspired very freely upon entrance to the Maternity, and that the secretion of urine at first was excessive. The child nursed naturally, its bowels were soon emptied, and its appetite was excellent. It gradually developed, however, symptoms of toxæmia, similar to those of an eclamptic patient. Its urine contained a great excess of uric acid, its skin became dry, and its bowel-movements were dark in color. The child was treated as would be a woman suffering from toxæmia. It derived the greatest comfort from a warm pack. Its intestines were irrigated, and simple diuretics were administered freely. The toxæmic condition considerably improved, and the child continued to nurse regularly. It never had convulsions, and slept when its excretory organs were freely stimulated. At the end of two weeks, however, it developed a purpuric condition of the skin and mucous membrane of the intestine, and died two weeks after delivery from inanition.

This case illustrates very perfectly the pathology of eclampsia, and the toxæmic condition transmitted to the child which proved so fatal to the mother. It was most interesting to observe that all of the child's nervous symptoms, restlessness, and suffering were directly relieved by that form of treatment which increased its excretions. In view of the fact that the child survived two weeks, that it nursed, and was relieved for a considerable time of threatening symptoms, the attempt to save its life seems to have been justifiable. As a post-mortem examination could not be obtained upon mother or child, the exact pathology of both cases could not be ascertained. Every symptom, however, pointed in mother and child to a profound toxæmia as the cause of the fatal issue.

This case illustrates most pointedly the imperative necessity of watching carefully the excretory processes of the pregnant patient. It is not sufficient to ascertain simply the presence or absence of albumin in the urine, but the physician must know that the skin, kidneys, liver, intestines, and lungs of the mother are performing the double duty which the presence of the fœtus entails. When this is carefully watched, sudden and profound intoxications like that described will rarely happen. An experienced observer will detect the effects of toxæmia upon the nervous system, and by suitable diet and prompt stimulation of the organs of excretion will, in the great majority of cases, succeed in averting the danger to mother and child. In the presence of profound toxæmia with eclampsia there is but a short time in which any form of treatment is of the slightest avail. The fatal line is passed so rapidly that, unless the physician is forearmed and forewarned, he may find himself in the presence of an unpreventable catastrophe.

RESULTS OF TREATMENT OF RHEUMATIC FIBROUS ANKYLOSIS BY BRISEMENT FORCÉ.[1]

BY W. R. TOWNSEND, A.M., M.D.,
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IN Foster's *Encyclopædic Medical Dictionary* ankylosis is defined as "any morbid condition of a joint in which its mobility is abolished or decidedly impaired." True ankylosis is bony in nature, while the false is that due to any other cause. There are several varieties of the false, the muscular being due to contraction of the muscles around the articulation, thus preventing free motion; the extracapsular, in which causes outside the joint, such as destruction of tissue and cicatrices, limit the motion, and the fibrous, caused by the development of adventitious fibrous tissue in or around the joint, the more serious cases being those in which it is within the joint.

A clear conception of these different varieties is absolutely necessary for many reasons. By ascertaining, if possible, whether the ankylosis is extra- or intra-articular, we may learn something of the history of the morbid process that produced it, and also be guided as to treatment and in making a prognosis.

In the first place, it is clearly understood that it is essential to determine whether, in a given case

[1] Read before the Orthopædic Section of the New York Academy of Medicine, January 17, 1896.

of ankylosis, the true or false condition exists, and that few will commit the error of the surgeon referred to by Mr. Brodhurst, of treating by extension for fourteen years a case of bony ankylosis in the hope of securing motion, or of the surgeon, Louvrier, who, elated with his great success in treating ankylosis, moved to a larger city and then failed completely, because he could not distinguish between the false and the true. In many cases an anæsthetic is necessary, and it is then seldom difficult to distinguish between the two.

A review of the literature of the subject shows that most of the authorities speak of fibrous ankylosis as synonymous with the false, and use the terms indiscriminately. To the student who desires information as to how to treat a given case, the knowledge to be obtained is most unsatisfactory. Some of the well-known text-books on surgery do not mention the subject at all; others dismiss it with a very few lines, and those that give the subject a chapter, no matter how brief, are not many in number.

Young[1] says "That treatment should not be undertaken until the original articular disease has disappeared or has been overcome by appropriate treatment, since too early manipulation may hasten what the surgeon is trying to overcome. The reduction in mild cases of false ankylosis can be accomplished by gradual manual and elastic traction. In more severe cases, forcible reduction (brisement forcé) may be performed with or without anæsthesia . . . the prognosis is generally good under modern surgical methods."

Bradford and Lovett[2] speak of ankylosis under the head of Etiology of Chronic Joint-disease, but say nothing of the treatment of the fibrous variety due to rheumatism.

Sayre[3] devotes two chapters to the subject and gives full and complete directions as to how brisement forcé should be used, and states clearly what steps should be taken in the after-treatment of the case. He publishes a number of most gratifying results, but says nothing of his failures, and makes no distinction between fibrous and other forms of false ankylosis. His work, however, is the best on the subject.

Ashhurst[4] says that we can improve position by brisement forcé, and that in those cases where we desire to produce mobility passive motion must be employed on the third day, the inference being that the desired result is secured.

The American Text-book of Surgery[5] says: "In the majority of cases a fibrous ankylosis will require for its removal either a forcible rapid breaking up of the adhesions and straightening of the limb, or a slowly effected correction of the deformity by continuous or intermittent traction, etc., but that both at the elbow and at the knee (after fracture of the patella) a resulting fibrous ankylosis, if forcibly broken up, will commonly be quickly reproduced, but with active use of the joint will generally spontaneously disappear in the course of a few months, or at most in a year or two."

Mansell Moullin[1] speaks of brisement forcé, and compares it with the partial and slow method, and gives most excellent advice as to the future management of the case, but is not at all clear as to the results produced.

Schreiber[2] has a most excellent article on ankylosis, but does not state positively what result may be expected after brisement forcé.

When we consider the monographs on the subject of the treatment of fibrous ankylosis, we find that brisement forcé has been recommended by Brodhurst, Bauer, Ollier, Palasciano, Velpeau, Bonnet, Buhring, Dieffenbach, Langenbeck, and many others.

Brodhurst[3] says that he had performed 267 operations for false ankylosis without a bad result, but does not give the details of the cases. He quotes Bauer as saying that he had seen 600 cases of contraction and ankylosis, and thus had most ample opportunity for most thorough clinical observation; and that all were agreed on the superiority of forcible rupture of adhesions as compared with gradual extension, and that the former opponents have been silenced by the overwhelming results which have been produced.

Brodhurst advises gradual extension, with or without tenotomy, or immediate flexion of the limb, with or without tenotomy, and subsequent gradual extension.

I have quoted thus at length to show that with but few exceptions brisement forcé is most highly commended, and yet are the results satisfactory in fibrous ankylosis due to rheumatism is a question that may well be asked. Some recent writers have stated that the adhesions may be reproduced, but not one has come out clearly to show the limits of the procedure. It certainly has its limits, and from a study of the cases here appended it would appear that, except to correct deformity, it is not productive of good results in cases of polyarticular rheumatism. Whether electrolysis will benefit such cases is an interesting subject, and has been carefully studied by Guyer,[4] to whose article the readers are referred,

[1] Young: Orthopædic Surgery.
[2] Orthopædic Surgery.
[3] Orthopædic Surgery and Diseases of the Joints.
[4] International Encyclopædia of Surgery.
[5] Edited by W. W. Keen and J. William White, 1892.

[1] System of Surgery.
[2] General Orthopædics, including Surgical Operations.
[3] St. George's Hospital Reports, 1871.
[4] Annals of Surgery, August, 1893; New York Medical Journal, June, 1895.

as this paper is simply a report of the results of brisement forcé in the treatment of fibrous ankylosis due to rheumatism in the cases the author has personal knowledge of.

Some may argue that most of them were not suitable for the operation, and that a failure might have been expected. My only reply is that practically every text-book on surgery recommends the procedure and says nothing of its limitations or failures, and it seemed justifiable in every instance. In the eleven cases reported, one complete success was achieved, in a case where only the shoulder was involved; one partial success, but it really can hardly be said to be due to brisement forcé, as it was only attempted once, and the subsequent treatment should really be credited with the result. The nine failures were all in cases of multiple fibrous ankylosis, rheumatic in character. Where a slight amount of motion exists at the time of bending the joint there is perhaps a slight hope in some cases of benefit, and in those cases where the adhesions snap, as in a fracture, the prognosis seems better than where they tear. It should be used to correct deformity unless the correction renders the patient's condition really worse, as in Cases V. and VI., where a flexion-deformity of the hip was corrected, and now with the hips fully extended the patient cannot sit down. Of course, it was hoped to have motion, or the limbs would have been left in the flexed position. Where we bend the hips we should, therefore, be careful to place them in such a position that if the ankylosis remains a sitting posture can be assumed; in other words, leave a moderate amount of flexion-deformity. In every case we must be sure that no active disease exists at the time of the operation, and it would seem better if after a failure to secure motion we did not repeat the procedure too soon, but rather rely on massage, electricity, douches, and such measures. The mistake may have been made in some of these cases of moving the joint too freely, but the cases that were only partially moved do not seem to have done any better than those that were moved through the full range of normal joint-motion. Many of the reported cures in literature were undoubtedly in individuals in whom no fibrous adhesions had taken place within the joint, but were cases of extra-articular adhesions or of muscular contractions. In others, however, there is no reason to doubt that true fibrous intra-articular adhesions existed, but in most of these successes only one joint was involved and polyarticular rheumatism is generally more severe in character than the monoarticular variety.

The accidents that may be caused by the use of too much force or by force improperly applied may be serious in character, but in only one of the cases reported do we believe a fracture occurred, and in but one instance was the integument torn. Cases I. and II. were personal, the others were seen at the Hospital for Ruptured and Crippled or in the private practice of Dr. Gibney, through whose courtesy I am enabled to report them.

CASE I.—Female, single, aged twenty-one years. Admitted to Polyclinic Hospital January 26, 1895. Family history negative. Without known cause developed rheumatism in both knees and left elbow eight months previous; was treated in best possible manner in another hospital, both by internal and external medication, and had made a good recovery except that both knees were ankylosed in a straight position. Left knee could be moved voluntarily over an arc of about 10°. No motion in the right. Patellæ movable.

January 29. Under ether-anæsthesia left knee forcibly stretched to full limit of flexion and back to the straight position; much force was required, and tissues within the joint seemed to tear rather than break or snap. The patient was put back to bed, limb firmly bandaged, and cold applications made to the knee. A posterior splint applied to the leg and thigh. Patient suffered much pain and had to be given opiates for three days.

February 6. Any attempts at motion cause great pain. Is again given ether and same procedure repeated. This time the adhesions gave way more easily.

13th. Patient had less pain after the last operation, but cannot stand the pain of attempts to move the knee. There has been no swelling and very little extra heat in the joint as the result of the manipulation under ether.

20th. Under ether the left knee is moved and the right knee moved from the straight line to a fully flexed position, and then after being firmly bandaged is put up in a plaster-of-Paris splint midway between full flexion and extension.

23d. Pain is so great that the plaster has to be removed and limbs put up in a straight position. Massage is applied to the left knee, but is very painful.

No further efforts were made in this case, and when seen two months later both knees were perfectly stiff and fully extended.

CASE II.—Female, married, aged twenty-six years. Family history negative. Three years previous had an attack of inflammatory rheumatism in the left knee and the right wrist. The wrist had completely recovered. The knee was firmly ankylosed within about 10° of full extension; the patella immovable. The joint slightly smaller than that of opposite side. Patient was nervous and much worried at her inability to bend the knee, and as there were no contraindications, under full ether-anæsthesia, on March 14, 1895, the adhesions were broken up and fully extended first and then fully flexed. The foot was elevated and an ice-bag applied to the knee. She suffered much pain after the operation, but at the end of one week could move the knee voluntarily over an arc of 10°.

March 28. Under ether the limb again moved through the full range of extension and flexion and bandage applied and cold applications. Patient had less pain, and in a week was walking around

and moving a limb over an arc of about 15°. She kept trying to move the limb herself, and on several occasions I moved it for her, but could not increase the range of motion, and invariably caused great pain. The case was not seen after July 1st, but at that date there was no further gain in motion.

CASE III.—Female, single, admitted to Hospital for Ruptured and Crippled, November 1, 1892. Family history negative. Exact date of beginning of trouble unknown. On admission she is found to be much deformed. Has a bad lateral curvature; lies on the left side, with the left thigh adducted 45°, flexed to 80°, and rotated inward, thus completely closing the vaginal outlet. There is no motion in the hip; the knee is held flexed at 90°, but has a fair range of motion. The right thigh is abducted about 45° and extended to 120°. She has numerous cicatrices on various parts of the body, due to bedsores. The right foot is in equinus. December 1st, under ether, the left thigh is partially extended and abducted. Much force is required, and a tear in the soft parts results in the region of the left labium and marked venous hemorrhage follows. Shortly after this she developed a severe albuminuria, and no further efforts were made to correct the deformities.

CASE IV.—Female, aged fourteen years, single, admitted to the Hospital for Ruptured and Crippled, May 17, 1894. Family history negative. In 1885 her ankles became swollen, and at the end of four or five months it was noticed that both feet were drawn up, and that the joints of fingers of both hands were also affected. Massage, baths, and internal medication were resorted to and kept up for three years, but with no improvement. She is now unable to walk or stand. Lies on her back, the forearms flexed on the arms, the hips flexed on the pelvis, the knees on the hips. The right shoulder has fair range of motion, the elbow has flexion to 120°, extension to 80°; the wrist has slight motion. The left upper extremity is the same as the right. The first to fourth lumbar vertebræ project markedly and give the appearance of a Pott's disease. The hips are fixed at 130° of extension and permit of 10° of passive motion. The knees are firmly fixed at 90°, and the tibiæ subluxated. Patella fixed. The motion of ankle-joints is limited.

May 20. Has a Billroth splint applied to each knee, and by August 25th the right has been extended to 140°, the left to 135°.

26th. Under ether the knees are forcibly straightened to 180°. On October 3d daily massage is begun and on December 1st passive motion. She can now walk a little. The fibrous adhesions about the finger-joints are less marked.

March 13. Under nitrous oxide anæsthesia the knees are repeatedly and rapidly flexed and extended and then strapped with rubber adhesive plaster. This operation is repeated on October 16th and 23d, and from that time limbs immersed daily in hot water and rubbed. On January 1st, 15th, 29th, February 12th, 26th, and March 12th and 26th nitrous oxide is given and knees moved freely. On June 25th she is discharged; the shoulders and hips are stiff; the knees are movable, the right between 110° and 170°, the left between 100° and 170°; and patient can walk a little better.

CASE V.—Female, aged twenty years, admitted to the Hospital for Ruptured and Crippled, June 10, 1893. Five years prior to this date she had an attack of rheumatism, beginning in the knees and gradually extending to all the other joints of the body. The left shoulder, elbow, and wrist are stiff; the joints of the fingers badly distorted and enlarged; the right hip is extended to 140°, the left to 130°. Slight motion in the right, none in the left. The knees are held at 60° of flexion. Patellæ immovable.

July 14, 1893. Under gas the knees are stretched and plaster of Paris applied.

28th. Left knee fully extended under gas-anæsthesia.

September 1. The left hip fully extended under gas; it comes down with a sharp noise, and it is suspected that a fracture of the surgical neck of the femur has been made, but this cannot be positively made out. Plaster-of-Paris spica applied.

15th. Under gas the right knee forcibly stretched.

29th. Under gas the right knee again stretched.

October 23. Develops pleurisy on left side.

November 26. Massage and galvanism applied daily to the knees.

January 18, 1894. Limbs are thoroughly bandaged, and patient given Fowler's solution in increasing doses.

February 1. A slough appears on posterior aspect of the left leg, due to pressure.

May 10. Rubbed daily with salicylic acid in lanolin-ointment. From that time on various drugs were tried, including salol and protonuclein, but at the present date, January 17, 1896, her knees and hips are both ankylosed in the straight position, and only improvement noted in her condition is that she has a slightly better use of the finger-joints and of the left shoulder, parts which have been under no treatment.

CASE VI.—Female, aged nine years, admitted to Hospital for Ruptured and Crippled, September 28, 1884. In 1884 had inflammatory rheumatism. Both knees, hips, wrists, and finger-joints affected. She has motion over a small arc in all of them. The right hip can be extended to 120°, flexed to 90°. The left hip can be extended to 120°, flexed to 110°. Weights are applied to the limbs, and iodide of potash given internally. She had several attacks of acute rheumatism, and was treated by internal medication, was sent to Saratoga for three months in 1891, and had massage faithfully applied between 1887 and 1892, when, on April 26th, she was given ether, the adductions of the thigh divided, and the fascia lata of both sides and limbs were then put up in a straight position in a plaster-of-Paris spica. Since then she has had massage, and has been gradually gaining a little more motion each year, until to-day, January 19, 1896, she can walk quite well, but has a shuffling gait, and can only go slowly. The right hip can be extended to 180°, flexed to 140°. The left hip can be extended to 180°, flexed to 140°. The knees are straight.

Right has motion between 180° and 150°, and the left between 180° and 140°. She thus has to sit with knees projecting somewhat. The joints of the upper extremity have also improved, and she can dress herself and sew quite nicely.

CASE VI.—Male, aged seventeen years, admitted to Polyclinic Hospital, October 27, 1893. At the age of seven had a fall, injuring the right thigh, and soon after developed rheumatism in that hip. He was confined to bed for a week, and after getting up noticed that the limb was shorter and joint stiff. Two years later had trouble in his left hip. At the age of thirteen had rheumatism in both ankles, and later in both knees. Six months ago had similar attack in the temporo-maxillary articulations. His parents are healthy, but a maternal aunt and two maternal uncles have had rheumatism. He walks on crutches, and the joints of the upper extremity are all normal except the left elbow, which is stiff. Both hips are ankylosed at 110° of extension in moderate adduction, and rotation inward. No motion in the left, very slight amount in the right.

The right knee held firmly at 150°, but can be moved with some force to 90°; fluid in both joints. No grating, patellæ free. Ankles enlarged, motion through half normal arc.

31st. Under ether-anæsthesia (primary) the hips are moved over a small arc, firmly bandaged, and a weight and pulley applied.

November 6. Under ether-anæsthesia (primary) hips further moved.

January 26, 1894. Left knee straightened and hip moved; much force used.

May 9. Knees and hips straightened; has much pain.

July 11. Is having daily massage and hot fomentations. The left hip is in good position. No motion at hip, knee, or ankle. Right hip in moderate abduction, extended to 155°. No motion at any joints of this limb.

A note from the patient in 1895 states that he has no motion in joints of the lower extremity, and as limbs are straight cannot sit down.

CASE VII.—Female, aged twenty-two years, single. Seen November 23, 1889. Family history negative. In July last had an attack of inflammatory rheumatism involving the right elbow and left wrist. Was confined to bed for six weeks. Her elbow is firmly ankylosed at 160° of extension. No swelling. Her wrist held fixed at 150° extension. Attempts to move the wrist cause pain.

November 25. Under chloroform-anæsthesia the wrist is straightened and hyperextended.

December 13. Wrist is straight and has about 5° of motion. Active movements advised and a stimulating liniment.

February 6, 1890. Is given an apparatus to move the elbow.

May 22. Elbow broken up under ether-anæsthesia; joint snapped, no fracture produced, moved freely.

June 10, 14, 19, and July 16. Ether-anæsthesia, and elbow moved freely.

October 30. No motion in elbow. Patient seen three years later. No motion in elbow or wrist.

CASE VIII.—Female, aged twenty-five years, single, admitted to Polyclinic Hospital, December 18, 1887. Seven years ago had inflammatory rheumatism in left wrist, then one joint after another became stiff and to-day both shoulders have very limited amount of motion. Elbows have limited range of motion. The wrists have 10° of motion and firmly held, the right in 150° of extension, the left at 170°. The finger-joints are stiff. The right hip firmly ankylosed at 135° extension, with no adduction; the left fixed at same angle with slight adduction. The knees are fixed at 135°, right with tibia rotated outward, the left with tibia normal. The ankles stiff, feet in moderate equinus, toes hyperextended. Is ordered iodide of potash in increasing doses.

October 24. Under ether-anæsthesia all attempts to move right lower extremity failed. Left hip moved in abduction, flexion, and extension over a small arc. Limb firmly bandaged and ice-cap applied to knee.

31st. Left hip brought straight and knee and ankle. Foot put up in good position in plaster of Paris.

November 11. Under ether right knee, hip, and foot straightened. Tendo Achillis divided.

14th. Under ether motion obtained in both hips, firm flannel bandage applied to limb, and over this plaster of Paris.

January 27. Both hips and knees firmly ankylosed. Under ether the adhesions are broken up; patellæ immovable, left tendo Achillis divided.

March 5. Under ether the hips, knees, ankles, and left elbow broken up.

April 17, 1892. Is walking on crutches. All the joints of the lower extremity firmly ankylosed. No motion whatever. Upper extremity same as when first seen. No improvement noted.

CASE IX.—Male, aged thirty-one years. Seen October 1, 1886. Was in good health until September, 1885, when he developed rheumatism in right foot, hand, and wrist, and in left shoulder, knee, and ankle.

October 2. Under ether-anæsthesia the right wrist and ankle broken up, then strapped with adhesive plaster.

November 24. Brisement forcé again done under anæsthesia.

December 21. No motion in joints operated on.

CASE X.—Male, aged twenty-seven years. Seen in 1884. Had been subjected to brisement forcé on right knee at different times by the late Dr. Sands in 1882, and by the late Dr. Roberts in 1884. Knee now perfectly stiff.

CASE XI.—Male, aged forty-four years. Seen in 1885. In May of that year had rheumatism in left shoulder, which was left perfectly stiff.

September 23. Under ether-anæsthesia the shoulder moved freely in every direction. After this hot douches and the Paquelin are applied.

October 23. Under ether the adhesions are again broken up.

November 2. Cannot move the shoulder. Is ordered massage.

February, 1886. Much improved.

June 15, 1887. Result perfect. Can move one shoulder as well as the other.

NEW YORK CITY, 28 WEST FIFTY-NINTH STREET,

ORIGINAL ADDRESS.

A REMARKABLE CASE OF GASTRITIS GRAVIS.

BY TH. ROSENHEIM, M.D.,
OF BERLIN, GERMANY.

Translated from Transactions of the Berlin Medical Society,

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AUGUSTA W., aged fifty-eight years, of healthy family, has had typhus (typhoid, probably) twice and pneumonia three times. She has borne four children, which died early of some brain-trouble and quinsy. For twenty years she has suffered with headache, leading to rheumatic pains, but the stomach has always been healthy. Ten weeks ago, in March, 1893, headache began to be attended with loss of appetite, and later vomiting set in. After two weeks she was so exhausted as to be unable to leave her bed. The pains in the head were localized mostly in the temples and over the brow. They were accompanied by darting pains in the muscles of all the extremities. Occasionally enuresis occurred. Then speech became rather slow and difficult, and for the last four weeks she has suffered with breathlessness and palpitation of the heart. There has been progressive emaciation since the beginning of the trouble. Present condition, May 20th, on admission to the hospital—pale, exhausted, emaciated, of marked bony development, a few ecchymotic spots on the chest; in the most dependent portions of the chest, catarrhal râles. Respiration regular, 24 to the minute; heart normal; pulse 100; knee-jerk present; fibrillary twitchings and slight tremor of the tongue. Blood-examination without significance. In the abdomen a hard resistance is felt about the pylorus, quite tender on pressure. Stomach displaced and dilated; serious motor disturbance. No albumin in urine. Fundus of eyes normal.

May 25. Has vomited repeatedly in the last few days. Constipated. Improvement from administration of bits of ice and sherry. Occasional rise of temperature to 38.6.° Passages firm, scanty, without pathological significance.

June 3. In spite of careful diet and lavage, vomiting has returned. The stomach-contents are odorless, containing no sarcinæ; free hydrochloric acid never present, but the contents are acid and uniformly give the reaction of lactic acid after the usual test-breakfast. Slight febrile movement, with acceleration of pulse, from time to time. Urine free from albumin. Progressive emaciation.

10th. Further examination of the digestive apparatus shows that there is no obstacle in the œsophagus. Stomach dilated; the resistance originally felt has become a tumor about the size of a walnut—that is, hard and slightly painful on pressure, very movable and doubtless connected with the pylorus. Passages from bowels scanty. Stomach-contents lack hydrochloric acid; Uffelmann-test present.

21st. Stomach has been washed out pretty regularly. A subjective improvement has occurred, but the appetite remains poor in spite of medicines, and the weakness increases. Free hydrochloric acid always absent; Uffelmann's test present. Very little nourishment for weeks. The tumor is plainly palpable, as before. Traces of albumin in the urine, without casts. No œdema. In the last fourteen days no febrile movement.

After marked failure of strength the patient died June 26th, the diagnosis having been made of carcinoma of the pylorus.

At the autopsy there were observed great emaciation, bronchitis, slight thickening of the heart-valves, atrophy of the liver, spleen, and kidneys. Intestine and brain normal. No trace of carcinoma of the stomach, and the stomach was given to me for more thorough examination. I found it strongly dilated, the greater oblique diameter being 28 cm., the distance of pylorus from cardia 20 cm. Mucous membrane pale gray. Pylorus penetrable by the finger; walls thicker than normal, 7–9 mm. The thickness was due to an increase in the muscular coat, which in some places measured 6 mm., the normal being 4 mm. Macrosopically, the mucous membrane at the pylorus showed no marked change, but that of the fundus, and especially toward the cardia, was too smooth and thin.

Microscopically there was found:

1. At the pylorus, hypertrophy of the muscularis, with spots of infiltration; vascular walls thickened in the submucosa, muscularis mucosæ partly penetrated by infiltration; the true mucosa shows interstitial growth, to which a compression of the glands is partially due. Normal tubules opening freely on the surface are sparse. Although the nuclei for the most part stain well, almost none of the secretory epithelium shows sharp contours. Some of the tubes are filled with hyaline masses which stain grayish-blue with hæmatoxylin and contain some particles that stain deep blue, the latter being, in some places, arranged along the walls of the tubules.

2. The wall of the fundus is not thickened. The muscularis is beset with infiltrations here and there. In the submucosa are a few hemorrhages. The glands of the submucosa are compressed by the strongly hypertrophied interstitial tissue; only the smaller proportion are atrophied. The secretory epithelium is normal only in places. Its place is taken in part by a pretty diffusely staining mass of nuclei.

3. In the cardiac portion the wall of the organ is thinnest, and the mucosa especially abnormally thin. Glands discharging freely on the surface are absent; the remains of the glands, in spite of vertical sections through the mucous membrane, are cut obliquely and lie deeply and crowded together. The epithelium of the glands is changed in the same way as in the fundus.

There is no macroscopical abnormality of the intestine. Its secretory and resorbtive function was scarcely altered according to clinical observations. The microscopical examination of the tissues supported this view. At the autopsy there was shown to be carcinoma of the pylorus, which was of normal calibre. Except bronchitis and marked emaciation, there was nothing but atrophy of the great abdominal glands. The more careful examination of the stomach showed only a considerable benign hypertrophy of the pylorus muscle and a severe chronic gastritis tending to atrophy, which

could be considered as of pretty high grade in the fundus near the cardia.

Can the findings of the autopsy in the stomach explain the clinical picture and death? I believe we may answer this question in the affirmative, although total atrophy was not present. We know that gastric atrophy is not a rare occurrence. Quite apart from atrophic changes which accompany carcinoma, this form of gastritis can be established as an independent disease. As such, it is rather frequent in elderly persons, particularly old women (Ewald); but it is occasionally noticed in quite young persons, as in the following case that I have had under observation for years:

Fred. B., thirteen years old, presented himself in 1889, complaining of gastric oppression and pain. Vomiting had been frequent of late and the pains were cramp-like. The appetite and the condition of the bowels were normal. He was a small, well-built, well-nourished boy, with a healthy complexion. Almost all of the back teeth and several of the front ones were lacking. There was a grayish-white coat on the tongue. Gastric area tender on pressure. About 30 c.c. of the test-breakfast were removed and appeared as if they had been chewed and spit into the glass directly. Reaction neutral, no peptone. The scanty filtrate, after the addition of hydrochloric acid, showed a delay in the solution of fibrin up to four hours. No marked motor trouble. The patient was frequently examined in the next eight months, the results not being especially significant. Codeine, pancreatin, and lavage ameliorated the symptoms, but there has been no change in the secretory activity of the stomach, as shown by an examination that I made in July, 1894. The dental defect was undoubtedly the cause of the severe gastritis passing into glandular atrophy.

That atrophy of the mucous membrane of the stomach is a grave affection, sufficient alone to cause death, is proved by the researches of Fenwick, Nothnagel, Quincke, Ewald, Rosenheim, and others. In some of the observations contributed up to date the affection has presented the picture of a progressive anæmia. (Nothnagel, Quincke, Henry and Osler, Rosenheim.) At times symptoms have appeared indicating degenerative processes in the cord—paresis, muscular spasm, atrophy, loss of patellar reflex, etc. Eisenlohr found in his case of atrophy of the gastric and intestinal mucous membrane that ran its course with the above-mentioned symptoms, the signs of grave anæmia, degeneration of the lateral and posterior columns. With our patient, Augusta W., the anæmia was only of such character as would be expected in any cachexia. Nervous symptoms, except headache, enuresis, palpitation of the heart, etc., which could be explained by the weakness, were absent. In the foreground were the loss of appetite and vomiting, without especial complaint of pain, and these symptoms could be explained solely by the gastritis, leading to atrophy. The gastric symptoms of this malady are very diverse. Pains, especially cramps, are present in part of the cases, vomiting is quite frequently lacking; the most frequent symptom is complete loss of appetite. Vomiting, in our patient, may well be ascribed to the dilatation that developed in the dislocated organ. Lavage might mitigate this symptom temporarily, but the motor function did not improve under this treatment, so that stagnation and consecutive vomiting always returned. Even if the ingestion of nourishment was limited essentially by the anorexia, only a fraction of what little was taken was utilized. Granting that assimilation remained normal—the feces were always formed and presented no abnormality—the small quantity of nourishment that reached the secretion could not possibly maintain the balance of nutrition. The rapid emaciation shows how seriously the economy was injured. It is clear that, in spite of loss of appetite, such a failure of strength would not have taken place if all that reached the stomach was really utilized. The critical point of the situation lies, therefore, in the disturbance of the motor function of the stomach. In none of the cases thus far published is the weight of this factor so plainly shown as in ours. We know that when the gastric secretion fails a compensatory activity may devolve upon the intestine, and, as long as the latter organ remains healthy, the general nutrition is good and patients may survive for years without losing the appearance of health. But the situation changes as soon as the food, which is not altered in nor absorbed from the stomach, remains there as the result of damage to the motor function. Herein is the importance of a dislocation of the stomach, which is so common in women, and which doubtless favors the development of atony and dilatation. As the motor weakness makes itself felt the organism seeks to compensate for the disturbance by hypertrophy of the musculature and certainly succeeds for a time; but the hypertrophied muscle, after years it may be, becomes insufficient, and then begin the symptoms of disease. The weakness of the muscular apparatus is not explicable by the pathological changes found therein. The slight interstitial hyperplasia indicates only that mild inflammatory processes have occurred, but we cannot see how they have influenced the motor activity of the organ. At last, for every hypertrophied muscle, whether of the heart or stomach, comes a time of failure, and this condition is capable of improvement only temporarily, if at all. The rapid course in our case is most remarkable, the duration from the first marked symptom till death being scarcely six months. Nothing, however, would be more erroneous than to suppose that the whole pathological process in the stomach occupied only so short a time. That atrophic processes in the gastric mucosa may develop with extraordinary rapidity, is shown by similar changes that we note as accompaniments of carcinoma; but in the vast majority of idiopathic atrophies the development and course are extremely chronic. The inflammatory process here occupied a long time, and the first complaints coincided with the failure of motor power. The considerable febrile disturbance, for which a cause could not be found, does not contradict the diagnosis of gastric cancer, since it is not rarely observed in that condition.

Among the signs of disease which were afforded by the stomach, the tumor remains to be explained. It was felt by all the examiners—its position, hardness, respiratory movements, and movability under the hand—all these signs, taken in connection with the other symptoms, left no doubt that we had to deal with a malignant neoplasm at the pylorus. Even a gradual enlargement was noticed, the easier and more exact palpability of the swelling, on account of the progressive emacia-

tion, being deceptive. All points of diagnosis always led us to the opinion of cancer. That form of disease known as cirrhosis, as well as the anomaly described as hypertrophic stenosis, was pretty unanimously excluded, on the ground that the course of the disease lacked chronicity. There was nothing to indicate a foreign body in the stomach; a peritoneal exudate was excluded by the extraordinary mobility and the slight tenderness of the tumor. There was nothing to justify the belief that there was an infiltration of the gastric wall at the base of an ulcer.

There is no doubt that hypertrophy of the pyloric muscle may simulate a neoplasm. Leube expressly states that swelling due to hypertrophy cannot be distinguished from a smooth and small pyloric carcinoma; that consecutive dilatation of the stomach and chronic gastritis are common to both. He bases his differential diagnosis on the origin of the condition and the exclusion of a cancerous cachexia, but our patient left us in the lurch so far as these points of differentiation were concerned.

Finally, when we consider the constant lack of free hydrochloric acid and the persistence of lactic acid in the gastric contents, the diagnosis of cancer seemed to be well founded. According to J. Boas, the distinction of such processes as we have here considered, from carcinoma, must depend on the positive occurrence of the ferric-chloride test, which is pathognomonic of cancer, since "lactic-acid production is a specific sign of gastric carcinoma." Boas has been the first to show the relation between gastric cancer and the lactic-acid reaction, but he goes too far in estimating the value of his discovery. It is doubtless true that, in the great majority of cases in which a distinct ferric-chloride test is obtained, there is gastric carcinoma. Exceptionally, Uffelmann's test can occur in other pathological conditions, as our experience teaches. If the reaction occurs in the filtrate of the gastric juice, removed at the height of digestion, after a test-breakfast, and occurs sharply—that is, shows a yellowish-green tint—it is significant as indicating positively that the lactic acid amounts to at least 5 : 1000, and such a finding is always pathological. On the other hand, the positive occurrence of the reaction in the ethereal extract is without diagnostic significance, since the slight traces of lactic acid that are necessary to render this possible are often found normally. Especially is this true when the test is carried on according to Fleischer's method, shaking the ether with the reagent and letting them settle. Even such traces as may be present in white bread or in Knorr's oatmeal are recognized by Fleischer's method. Boas has, therefore, further directed to give the oatmeal-gruel after washing out the stomach, and to apply the test for lactic acid according to his aldehyde method. This method was published after the death of our patient, and there were at that time no other methods to render possible a decisive test. From my control-experiments I can say positively that Boas's reaction, quite apart from its complexity, never succeeds where a marked Uffelmann-test does not occur. We have seen that the treatment by lavage was not sufficient to correct the motor weakness of the stomach. According to my experience, in the treatment of atony and dilatation of the stomach, the employment of electricity can scarcely supply the needed contractile energy. Nevertheless, in individual cases, the attempt ought to be made with intraventricular galvanism or faradism; but even when the weak organ shows itself incapable of forcing along the ingesta our armamentarium is not exhausted, and we can still appeal to surgery. Gastroenterostomy, performed by a skilful hand, is a safe operation, unless the loss of strength has proceeded too far. Of our last nine gastric patients on whom Dr. Hahn has operated, not one has succumbed, and the requisite functional compensation has been obtained. The stagnation has disappeared, and even the exhausted muscular wall is still strong enough to drive the ingesta through the hole in the deepest portion of the fundus into the intestine. Donin has lately again called attention to the favorable functional results of this operation in the case of ulcerative contraction of the pylorus, and I can cite similar life-saving results from my own experience. In my opinion, an anatomical obstacle is not necessary to justify operation. The salient point is the motor failure entirely apart from its origin. If it cannot be restored by medical treatment in a reasonable time, the case belongs to the surgical clinic. Exploratory cœliotomy is quite insignificant, and, after local inspection, a decision can be made as to the best plan to pursue. Considering the chances that an operation would have given in our case, we must admit that a gastro-enterostomy, undertaken at the right time, would probably have saved the patient's life. In a case of Westphalin's, similar to ours—that is, without constriction of the pylorus—gastro-enterostomy was done. The patient died on the fourth day, but the interference was made too late. Besides, there was well-advanced phthisis. The bad result in such cases is often due to the misapprehension that operation is a last resort, so that surgical interference is too long delayed.

CLINICAL MEMORANDUM.

APPENDICEAL ABSCESS OPENED THROUGH THE VAGINA.

BY P. GUNTERMANN, M.D.,
OF LOUISVILLE, KY.

ON September 4, 1895, I was called to see a young woman, aged thirty years, the mother of two children. Both labors were normal, both children living and healthy. The patient stated that she had never been ill in her life. She was small and wiry-looking, and gave evidence of perfect health.

The history is that on the second day of September she was taken with acute pain in the right iliac region. She is a woman that bears pain remarkably well. She did not at first think that the attack amounted to very much, but at night she was compelled to go to bed. She took some of the ordinary household remedies—paregoric, whiskey, etc.—which gave no relief. Some time during that night a neighboring physician was called, who prescribed, and the next day saw the patient twice. The pain at no time abated.

I was asked to see the case on September 4th, the third day of her illness, and found her suffering with intense iliac pain, vomiting, and purging. Her temperature at that time was 105° F., pulse 130, with a cold, clammy perspiration. There was some resistance in the right iliac region, much more than was present in the left.

After due consideration, I concluded that it was a case of appendicitis, and one which demanded prompt surgical interference. I sent for my friend, Dr. W. H. Wathen. We went together to see the patient in the morning about six o'clock, and found her then in profound shock. As soon as possible we secured the ambulance and brought her to the Infirmary. Under the influence of hypodermatic injections of morphine, etc., she rallied. She was, of course, not in condition to be operated upon that day, and, strange to say, in the evening her temperature went down, the pulse became less frequent, and the next morning she was feverless, and had nearly a normal pulse. Pain in the iliac region had very much subsided, but she had constant crawling pains throughout the abdomen. She had more or less diarrhœa all the time, three or four passages a day, preceded by some pain and followed by excessive pain. She went on in this way without fever—temperature 98½° to 99° F., pulse 70 to 80—for ten days.

On September 15th I saw her about noon, and noticed a strangely changed appearance in her features as soon as I entered the room. Her expression bore evidences of intense suffering; her extremities were cold; a cold, clammy perspiration was present over the surface of her body; pulse 130; temperature 101° F. I went at once for Dr. Wathen, as the case presented a very serious aspect. Previous vaginal examinations had been made, revealing no trouble about the vagina, womb, or pelvis; but upon this occasion, when Dr. Wathen introduced his finger into the vagina, an immense tumor was discovered, and it was then decided to operate upon her either that night or the following morning. Operation was performed the next morning by the vagina. There was a very large abscess found after making an incision behind the uterus, which discharged about a quart of fluid—so-called laudable pus. It was not very offensive at first, but directly it became fecal in odor, and some fecal matter was also discharged. This abscess was thoroughly evacuated and irrigated with bichloride solution; the opening was made very large, a tube was introduced, gauze inserted, and the patient put to bed. The operation was borne very well, and after the patient was put in bed the pulse came down to 90, temperature to about normal the same day. The following two days considerable fecal matter was discharged through the drainage-tube. On the third day Dr. Wathen removed part of the dressing, no fecal matter being found; the drainage-tube was caught in the adhesions or new plastic formations that filled the cavity, and two days afterward the balance of the gauze was removed, there being no discharge, but the drainage-tube was left *in situ*, where it still remains, the discharge through it, however, being insignificant, amounting, perhaps, to a tablespoonful in the twenty-four hours.

I diagnosed the case as one of appendicitis from the beginning, and subsequent results have proved that it was appendicitis with the formation of a retroperitoneal abscess which had to be opened by the vagina. This feature is something new to me, and I believe it is also to Dr. Wathen. There can be no doubt that it was a case of appendicitis. The operation was performed less than two weeks ago, and the patient has done remarkably well. She has been sitting up for two days, and says she feels almost well enough to be taken home.

MEDICAL PROGRESS.

Remarkable Persistence of Diphtheria-bacilli in Nasal Mucus.—At a recent meeting of the Société Médicale des Hôpitaux, LEGENDRE and POCHON (*Progrès Médical*, 1895, No. 52, p. 459) reported the case of a child that had been under observation for fifteen months, during which it was affected three times with diphtheria (once angina, once stomatitis and rhinitis, once rhinitis and angina). Bacteriological examination made methodically on thirteen different occasions demonstrated the presence of diphtheria-bacilli, sometimes virulent, sometimes not, varying in form and size, and sometimes alone and sometimes associated with staphylococci. The organisms would disappear upon antiseptic irrigation, but would reappear when this was withheld. The case illustrates the condition of latent microbism.

The Influence of Nuclein-containing Food upon Uric-acid Formation.—As the result of a clinico-physiologic investigation, UMBER (*Zeitsch. für klinische Medicin*, Band xxix. Heft 1 and 2, p. 174) has determined that the daily ingestion of 500 grammes of thymus is attended with a distinct increase in the elimination of uric acid, as compared with the daily use of 500 grammes of muscular tissue. The daily ingestion of 300 grammes of thymus, however, increases but slightly such elimination. The daily ingestion of 500 grammes of liver induces varying degrees of increase in the excretion of uric acid, while the ingestion of the kidneys and the brain of the calf brings about changes in the elimination of uric acid comparable with those following the use of muscular tissue. When there is a preponderance of milk in the diet the excretion of uric acid is less than upon meat-diet. The amount of xanthin-bases excreted in health varies widely. It is increased by the ingestion of alkalies and also by the use of a milk-diet.

The Coagulation of the Blood and the Salts of Lime.—As the result of an experimental investigation, ARTHUS (*Archives de Physiologie*, 1896, No. 1, p. 47) has determined that all of the salts (oxalates, fluorides, soaps) that possess the property of precipitating the salts of calcium from their solutions possess, in quantities in which they are not decalcifying, also the property of rendering the blood not coagulable spontaneously. When to blood-plasma containing oxalates in the proportion of 1 to 1000 are added several parts of magnesium chloride (which does not cause any precipitation of the dissolved oxalates) the coagulation of the plasma may be effected by very small quantities of calcic salts—quantities insufficient to precipitate the dissolved oxalates. It thus appears that the coagulation of the fibrin may take place in the presence of a large excess of oxalates, provided that by a suitable method a small quantity of the salts of calcium is maintained in solution and free. When the excess of oxalates is removed by dialysis from the plasma coagulation may not take place, although a sufficient amount of sodium chloride is present to insure the precipitation of the fibrin. These facts go to show that blood containing oxalates in solution is not coagulable spontaneously because it is decalcified and not because it contains oxalates. It thus results that the presence of the salts of calcium in solution in the blood is a necessary condition of coagulation.

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SATURDAY, FEBRUARY 1, 1896.

CORPORAL PUNISHMENT IN INSTITUTIONS.

MR. DUDLEY WARNER, a strong advocate of corporal punishment in reformatories, characterizes those who oppose cruel disciplinary methods in public institutions as suffering from "*moral mushiness.*" The report of cruelties practised upon the inmates of the "Westchester Temporary Home for Destitute Children," at White Plains, N. Y., by the State Board of Charities would seem to prove that there are some people in Westchester of Mr. Warner's way of thinking. Here is a charity having a large Board of Managers, who are the most respectable ladies in that county, in which the method of punishing children who have attempted to escape is to chain the legs together at the ankles and compel them to wear the chain day and night for months. In one case the child wore a chain, weighing three pounds, seven months continuously. The chain was fastened on each ankle by padlocks and with such slight protection of the skin that a callous ring had formed around the ankles. The State Board of Charities, we believe, expressed the better sentiment of the people of that county in the declaration:

"That whatever may be said in favor of or against corporal punishment by whipping of children in families or in common schools, its tolerence in corporate and private institutions, without its natural restraints of parental instincts in the family, and of public criticism in the common school, is a tolerance that cannot be divorced from an evitable tendency to abuse; and further, that once admitted as an exceptional or extraordinary remedy, its use inevitably extends, until it becomes the chief reliance for enforcing discipline, and that familiarity with this form of correction leads to cruelty, brutality, and inhumanity, and is pernicious in its influence on both officers and inmates, and in the end detrimental to discipline."

It is gratifying to notice, also, that the Board not only condemned these cruel methods in general, but instructed its Secretary

"to forthwith notify the managers of the Westchester Temporary Home for Children, in writing, that the use of chains upon the children in its custody for punishment or restraint must at once be stopped and that corporal punishment upon such children must be abandoned, and that upon failure to comply with this instruction this Board will issue its mandate under the Constitution and the statutes, and proceed to enforce the same."

PREFERENCE OF THE DIPHTHERIA-BACILLUS FOR THE TONSIL.

IT has long been a somewhat puzzling problem to clinicians just why the tonsil is almost universally the point of attack in diphtheria. Its peculiarly exposed position at the junction of the food- and air-passages, and liability to infection from both sources, are possibly responsible for part of this, but certainly not for such a strikingly "bad eminence" as it possesses in this respect. For it obviously is not half as liable to air infection as the turbinated bodies, or to food infection as the mouth or the stomach, being merely brushed by the food in its passage from one to the other, and yet it is at least five times as frequently the site of attack as either. Another theory is that being a rudimentary organ, or lymphoid aggregation around the mouth at the second bronchial cleft, it is a *locus minoræ resistentiæ*, and hence specially vulnerable; but any such "historic" weakness as this would certainly be more than overbalanced by the fact that the mass has been secondarily developed into a leucocyte-breeder and sanitary-police-barracks for the entire upper alimentary canal, so that for a germ to choose this as a breeding place would be like a burglar attempting to rob a police-station, if this be the only factor.

An interesting light has been thrown upon the problem by the methods adopted in cultivating the Klebs-Loeffler bacillus for the manufacture of Behr-

ing's antitoxin. After starting a culture upon its nutrient medium, it was found that the production of the toxin went on quite rapidly at first, but in a very short time began to diminish and finally almost ceased. If, however, the air in the flask above the culture was now renewed, the production began again at once, so that by constantly changing the air the production continued unchecked, while by passing a rapid, constant current of air through the flask it was formed three or four times as rapidly as before. An essential part of the perfected routine now is the maintenance of a rapid current of air (sterilized) through the flasks containing the culture-media by means of a hydrostatic vacuum-apparatus, by which the requisite degree of virulence in the culture can be developed in about one-fourth of the time required under the old "dead-air" method. Evidently the bacillus flourishes best not only in the presence of oxygen, but in a current of air. And where in the entire alimentary canal can this requisite be met except upon the back part of the inner surface of the tonsil? Which is precisely the point of attack in 80 per cent. of our cases. It seems to be pretty clearly established that diphtheria almost invariably enters the system through the alimentary canal, either in the food or drink, or by labial contact, and the comparative immunity of the mucosa of both mouth and stomach from attack has been a matter of surprise, for which, however, the absence of an air-current in these situations gives, at least, a plausible explanation. The mouth is, of course, frequently attacked, and the stomach in rare instances, but both almost always secondarily, after the germ has gained a vigorous foothold upon the ventilated surface of the tonsil. This demand of the germ also helps to explain its marked tendency to extend along the air-passages rather than the alimentary tube, and also the fact that its most vigorous and virulent growth occurs at the point where the air-current is most rapid, the interior of the larynx, the trachea, and especially upon the vocal cords. The extreme virulence and high death-rate from systemic poisoning and heart-failure of diphtheria of the nasal passages are also more easily understood. May not the special liability of the nerves of the palate-muscles in general, and azygos uvulæ in particular, to peripheral neuritis and paralysis after diphtheria, be partially due to their nearness on both aspects to surfaces swept by a current of air and hence peculiarly suited to the development of a virulent form of the toxins?

Fortunately, however, the tonsil is, to use a Hibernicism, not only the most vulnerable, but one of the best protected places in the body. For every dart nature seems to have a shield. And in this case the shield consists of the swarms of leucocytes poured forth by the gland. They cannot defeat the enemy in a fair fight upon a field of his own choosing, for they are sappers and miners rather than riflemen, but they bravely bar his way into the heart of the country by a solid rampart of rank upon rank of their dead bodies. This is the famous and much-maligned "membrane," which happily in a large majority of cases is successful in mechanically cutting off the Klebs-Loeffler pirate from the base of supplies which he hoped to establish in the rich inland districts. When his forces have become enfeebled by starvation, the membrane craftily detaches itself and sweeps the invading army down with it into the war-like gastric districts, where the leucocytes have all the advantages of the situation; can massacre the bacilli at their leisure and eat them afterward.

This again coincides with the clinical observation—that so long as the membranes are well developed and *confined to the tonsils*, the constitutional symptoms are usually few and mild, and reinforces the *old* teachings as to the danger of forcibly detaching the membranes, and the *modern* ones as to the harmfulness of too frequent swabbings. It also fits in with the fact that many of the most rapidly-fatal cases are attended by the formation of very little membrane, or of only a thin pellicle, as is usually the case in nasal diphtheria, where both the fixed cells and leucocytes seem simply overwhelmed by the virulence and rapid production of the toxins before they have time to form a membrane.

Nature is wonderfully skilful in guarding her weak points, and although, as the little girl remarked of boils, "there's no *real good* place to have them," yet if we may be allowed so to express ourselves, if we *must* have diphtheria, there is probably no safer place to have it attack the internal surface of the body than the tonsil.

ECHOES AND NEWS.

THE State Senate's Cities Committee is considering the proper location for a hospital for the exclusive use of scarlet-fever cases in New York City. One hundred thousand dollars have been subscribed toward its erection by private individuals.

THE late Mrs. A. R. Aspinwall leaves her whole estate, valued at three millions, to the Hospital of the Protestant Episcopal Church of Philadelphia. The will is liable to be contested by her niece.

THE oldest medical recipe, according to a French medical journal, is that of a hair-tonic for an Egyptian queen. It is dated 4000 B. C., and directs that dogs' paws and asses' hoofs be boiled with dates, in oil.

AN unfortunate altercation is reported to have arisen between the Post Surgeon at Jefferson Barracks, Mo., and his assistant. The court-martial has sentenced the latter to suspension from rank and confinement to post-limits for three months.

THE usual complaint is that the ambulance-surgeon does too little too late, but in the recent case of Babcock, the Harlem Hospital seems to have promoted a young doctor who did too much too soon. Every complaint against the ambulance-service could easily be overcome by a little wholesome discipline.

AT the annual meeting of the Board of Directors of the New York Post-Graduate Medical School and Hospital the following officers were re-elected for the ensuing year: President, Dr. D. B. St. John Roosa; Vice-President, Dr. Andrew H. Smith; Treasurer, Dr. Bache Emmet; Secretary, James L. Skillin.

DR. ELIZA M. MOSHER, of Brooklyn, was recently appointed Woman's Dean and Professor of Hygiene of the Literary Department of the University of Michigan, at Ann Arbor. She has long been a prominent member of the profession, and is now Vice-President of the Pathological Society of Brooklyn.

THE experiment of bicycle-wheels for the Brooklyn ambulances is being put to practical test. Although each wheel represents a cost of fifty dollars, the saving in the item of repair, it is thought, will more than offset this, to say nothing of the increased comfort, and perhaps diminished mortality of the patients.

AN amendment to the Sanitary Code of New York City was recently passed and will go into effect in about a week, requiring all milk-dealers, both wholesale and retail, to provide themselves with a licence. To obtain this they must give the Health Board evidence that their business is conducted strictly in accordance with their rules regulating the milk-supply.

DR. HUNTER MCGUIRE, of Richmond, Va., who is an honorary member of the State Medical Societies of Virginia, West Virginia, and North Carolina, offers a prize of one hundred dollars to be awarded at the next meeting of the Virginia Medical Society in October, 1896, for the most successful essay on "The Status of Serum-therapy." Competition is restricted to members of the societies mentioned.

THERE are 1500 registered physicians in the State of North Carolina, each of whom pays a State tax or licence-fee of $10 per annum; 465, or about one-third, are members of the State Medical Society. The next Legislature will be asked to appropriate the amount of this tax, $15,000, to the establishment of a State vaccine-farm, with provision also for the cultivation of diphtheria-antitoxin.

DR. EDWARD WIGGLESWORTH, of Boston, died there January 20, 1896. He was born in Boston in 1840, and was graduated from the Harvard Medical School in 1865. He served in the Medical Department of the Army for two years during the Civil War. Dr. Wigglesworth spent five years in Europe studying skin-diseases. He founded the Boston Dispensary for Skin Diseases in 1872.

AT an expense of $35,000 for text-books relating to the evils of alcohol and tobacco, the public schools of New York City are prepared to begin the course of forty lessons prescribed by the "Ainsworth Law," which passed the Legislature last year. This Act, which has been contemptuously called the "Jag" Bill, has been the subject of much ridicule, and efforts are now afoot for its early repeal.

AT the annual meeting of the New York County Medical Association, held Monday evening, January 20, 1896, the following officers were elected: President, Dr. Joseph E. Janvrin; Vice-President, Dr. Herman J. Boldt; Recording Secretary, Dr. P. Brynberg Porter; Corresponding and Statistical Secretary, Dr. Nathan Gross Bozeman; Treasurer, Dr. John H. Hinton; Member of the Executive Committee (to serve for four years), Dr. John Shrady.

DR. CASSANOVA, of Bourges, calls attention to the dangerous qualities of cotton-flannel, an article in constant use, especially in the apparel of women and children, and cites three recent cases occurring in his practice in support of his observation as to the highly inflammable nature of this fabric. It is not easily ignited by contact with a live coal, but the blaze of a match or lamp will cause it to flash like gunpowder. His warning in this matter is very timely and important.

A CONCENTRATED antitoxin has been produced by the New York Board of Health. Whereas the serum prepared by Behring and designated by him as Nos. 1, 2, and 3, contained respectively 60, 100, and 150 antitoxin-units per cubic centimetre, the Department is now ready to dispense what it will indicate as No. 4, with a strength of 200 antitoxin-units to the cubic centimetre, No. 5 representing 300, and No. 6, 400. In using these it will be necessary, of course, to reduce the dosage in accordance with the increased potency of the new products.

DR. MARMOREK, a young Viennese physician, after four years of research, has been rewarded by the discovery of a healing-serum to be used against erysipelas and other infectious inflammations of the connective tissue, and also in puerperal fever. It is a product of the streptococcus and is produced like antitoxin. In the hands of the profession of Paris it has given rather promising results. Dr. Chantemesse has tested its efficacy in 500 cases of erysipelas, in which the mortality was 2.59 per cent., while 500 other cases treated by the other approved methods of the present day gave a mortality of 3.79 per cent.

A WELL-KNOWN Philadelphia physician, whose name need not be mentioned for obvious reasons, is in a fair way greatly to increase his already large income through a discovery which he claims to have recently made. The

doctor comes of good old stock, and is quite a figure in Philadelphia's most exclusive society. His discovery, brought about by experiments made upon his own person, is nothing less than the existence of a distinct and separate corpuscle of blue blood. When the result of his researches gets noised about the doctor will doubtless be overrun by Sons of the Revolution, Colonial Dames, and members of other similar patriotic organizations in which ancestry is necessary. In the near future we may expect to hear: "I say, old chap, come take a peep through my microscope and see my blue blood-corpuscle."—*Philadelphia Record*.

THE State Commission in Lunacy has appointed Dr. Ira Van Gieson, of New York, to the position of Director of the Pathological Institute of the State Hospitals for the Insane, which has recently been established. Dr. Van Gieson was selected after a special competitive civil-service examination, which embraced a series of questions in general pathology, minute and pathological anatomy of the nervous system, technique and methods of neural investigation, and the lines of research to be applied to the study of the pathology of insanity. The laboratory, which is to be maintained for the benefit of all the State hospitals, will be conducted on a scale which has not hitherto been undertaken by any State or country, the aim of the commission being to provide for an exhaustive study of all the morbid conditions that underlie mental diseases from the standpoint of cellular biology, which is now elevated to the dignity of a special science; also to provide instruction in brain-pathology and allied subjects for the medical officers of State hospitals. Official bulletins representing the progress of the laboratory and clinical work of the State hospitals will be issued quarterly.

THE MEDICAL NEWS is glad to bring to the notice of its readers the following appeal for the perpetuation of the memory of one of America's greatest scientists:

The Leidy Memorial Fellowship in Anatomy.

It has seemed unjust to many that there is no suitable memorial to perpetuate the name of Joseph Leidy, the great scientist and teacher. A committee has therefore been organized from among his old students to raise whatever money may be necessary for the accomplishment of this object.

There is no idea more suitable, no testimonial more practical, or none which would appeal more to the judgment of the great investigator himself, than the establishment of a Fellowship in Anatomy, the great division of medicine which he loved so well. As the University of Pennsylvania was the scene of the greater part of his labors, the committee has thought it best to establish the Fellowship in that institution.

The creation of the Fellowship will not only perpetuate the name of Leidy, but will enable some practical working anatomist to carry on original work in the University, and to utilize the vast collection of material which is deposited in the Wistar Museum.

Thirty thousand dollars will put such a Fellowship on a permanent working basis, it being intended that the income from this sum should be paid to the Fellow, thus enabling him to pursue his studies with the assurance that his daily wants will be provided for. We appeal to you, therefore, as lovers and admirers of the gentle, humane scientist, whose achievements have made his name familiar on two continents, to aid us by subscribing to this fund.

The movement is a general one, and if you desire further information in regard to the purposes of this memorial, and the regulations which will govern it, we will be glad to communicate with you.

Communications and remittances should be addressed to the Secretary and Treasurer.

DR. J. HOWE ADAMS,
1523 Locust Street,
PHILADELPHIA.

THERE has been in Duluth an epidemic of about 1000 cases of typhoid fever, with 30 deaths, caused, it is believed, by the infection of the water. An inquiry disclosed the facts that the intake of the water company in the adjoining great lake was only 359 feet from the shore, was in a filthy condition, and was situated about 800 feet from the mouth of a large sewer. It appears that the superintendent himself has for a year or two procured water for his family from a spring several miles from Duluth. The city now compels the company to supply spring-water to consumers without additional cost. The supply is said to be abundant and the quality of the water pure and excellent.

DRS. BIGGS and PRUDEN have made to the New York City Board of Health the following report and recommendations, which were adopted at the last meeting:

"It has been for a long time well known that the expectoration of persons suffering from laryngeal or pulmonary tuberculosis (consumption), pneumonia, influenza or la grippe, and from diphtheria, contains the specific germs of those different diseases, and is capable of inducing those diseases in others.

"There is, furthermore, much evidence that a similar condition exists in certain more readily communicable diseases, such as scarlet fever, measles, and whooping-cough.

"In regard to some of these affections, the danger from the expectoration in public places is, of course, small, as the patients are ordinarily confined to their homes during the infectious period. But this is not universally the case. It has long since been shown that the chief means for the transmission of consumption is the dried and pulverized sputum of persons suffering from this disease.

"Diphtheria, influenza, and grip are also easily communicated in this way during certain stages of the disease. Catarrhal affections may also be communicated through dry spittle mixed with dust.

"These germs are liable to be gathered on the feet and on the skirts of women and taken into private houses, where the most perfect ventilation will not stay their effect.

"We believe that the time has now arrived when the people of the city of New York will heartily support the adoption of such sanitary measures as may seem necessary and expedient for the abatement of this widespread nuisance and source of danger.

"We would recommend the following resolutions:

"*Resolved*, That notices be posted in all public places and in all surface and elevated cars in this city, signed by the Board of Health, warning passengers against ex-

pectoration upon the floors of these conveyances; and, further, that similar notices be posted in the stations of the elevated roads, warning against expectoration upon the platforms and stairs or on the floors of the stations.

"*Resolved*, That similar notices be posted in the halls and assembly-rooms of all municipal and Federal buildings in the city.

"*Resolved*, That the municipal authorities be requested to provide sufficient and proper receptacles for expectoration in such public places as are in their control, and that the managers of the elevated roads be requested to provide similar receptacles sufficient in number for their stations and platforms, and that in all cases these receptacles shall be kept in a cleanly condition.

"*Resolved*, That the officers of the Manhattan Elevated Road be requested to give peremptory orders to their guards to restrain from and to prevent, so far as possible, expectoration from trains into the streets, and to secure the inforcement of these orders."

SOCIETY PROCEEDINGS.

NEW YORK NEUROLOGICAL SOCIETY.

Stated Meeting, January 7, 1896.

EDWARD D. FISHER, M.D., PRESIDENT, IN THE CHAIR.

PROGRESSIVE MUSCULAR ATROPHY.

DR. G. M. HAMMOND reported a case of progressive muscular atrophy beginning in the facial muscles. He said that many such cases were looked upon with suspicion, but in this instance the history was so clear that he felt the diagnosis was correct. The photograph exhibited had been taken about one year ago. The patient was a middle-aged woman, who at one time was exceedingly vigorous and muscular, and weighed one hundred and eighty pounds. She weighed over one hundred and sixty pounds prior to the advent of this disorder. The family history was excellent, there being no nervous disorder of a serious nature. Fourteen years ago, while a nurse, she had contracted some skin-disease which had resulted in the development of a number of abscesses. About two years ago she began to notice a hollowing of the left cheek and temple, and this had increased until at the present time the atrophy was very marked. The next thing noticed was a weakness of the arms and legs and atrophy of the muscles in these parts. The paresis and atrophy seemed to affect both arms simultaneously, and later both legs. Quite recently the atrophic process had begun to affect the right side of the face. He had first seen her in October, 1894, at which time all muscular efforts were performed with difficulty; fibrillary twitchings could be observed on the left side of the face, and less frequently in the upper and lower extremities. The electrical reactions were normal in quality, but reduced quantitatively. There were no disorders of sensibility, except that at times there had been some rheumatic pains in the neighborhood of the knee-joints. At first the reflexes were exaggerated, but at the present time the knee-jerks are less active than when first seen. The main point for consideration was whether this was a primary myopathy, or whether it was of secondary origin. The fact that it began in the face might lead one to suppose that it was a primary atrophy, but it should be remembered that this disorder began in the latter half of life, there was no family history of this disorder, and the distribution did not correspond to that which was observed in the primary disorder. Moreover, in primary myopathy the muscles of the forearm and leg would escape the atrophic process, whereas in the case presented these muscles were all involved. The case was chiefly of interest from the situation of the primary points of atrophy, which he considered to be very unusual indeed. The case was unusual in that the muscles were not affected in groups, but it did not follow the course of the dystrophics, and it seemed to him that the case must be of central origin. He thought it was not a case of progressive facial hemiatrophy, because there were no changes in the bones or in the skin, and because other parts of the body were involved, and the other side of the face was already beginning to be involved. The process was evidently progressive; the patient was decidedly weaker than a year ago.

JACKSONIAN EPILEPSY; OPERATION.

DR. HAMMOND also exhibited a man who had had Jacksonian epilepsy, and had been operated upon several months ago by Dr. Abbé. His attacks had come on with a sensory aura in the hand. He had had as many as fifteen or more convulsions a day. The operation was done on the left side of the skull last March. On removing the bone, the operator had found a circumscribed area of pachymeningitis, and a considerable adhesion of the membrane underneath. A piece of thin rubber tissue had been inserted after separating the adhesions. The bone had then been replaced, and the wound closed. There had been no convulsions since this operation. Prior to it the bromides had had no effect on the attacks; since the operation these remedies had been given. Quite recently the aura had returned, but there had been no attacks. The speaker said that he could not see the advantages of using the rubber tissue, which in this case had been employed in lieu of gold-leaf. There was a well-marked history of syphilis, and this was considered to have been the origin of the disorder.

RAYNAUD'S DISEASE.

DR. A. WIENER exhibited a man who had been referred to him by Dr. Goldstein. Nine years ago the patient had had a fracture of the left forearm with no accident to account for it. Iodide of potassium was necessary in addition to splints to secure proper union. Later one of his toes had become carious and had been finally amputated. The great toe was similarly affected subsequently, but under local and constitutional treatment this too healed. Inquiry showed that eight years ago this man had been a brass-polisher. At the time of the original fracture there had been no pain. A few months after this he had developed severe pains over the chest and forearm. He then changed his occupation, and after this was exposed a great deal to the weather. At the present time the same gangrenous process which had been present in the toes was going on in the fingers of one hand. This history, the speaker said, made it evident that the patient was suffering from Raynaud's disease. He had excluded syringomyelia, because there

were no sensory disturbance and no pain. There was no sugar in the urine. He expected to put this man to bed and pack his feet in cotton. Constitutional remedies would, of course, be employed.

DR. C. A. HERTER said that there could be little question regarding the diagnosis. As to the local condition and the sclerosis of the vessels, he thought it was secondary to the extraordinary changes in the bloodvessels.

DR. JOSEPH COLLINS said that he also felt that there could be no doubt about the diagnosis, and he also agreed with the last speaker regarding the relation of the changes in the vessels to the present symptom-complex. He had seen two cases of Raynaud's disease during the past year. The administration of iodide of potassium and nitroglycerin—the treatment usually recommended—he considered rather dangerous unless carried out cautiously. The only treatment apparently of service was placing the patient in the horizontal position for a long time, together with the administration of moderate quantities of water and measures to maintain vascular equilibrium. Where it was possible the patient should be sent to a climate which would admit of his living outdoors almost all the time. In looking up the literature of Raynaud's disease he had been surprised at the statement made by several operators that this was an incurable disease. Personally he was of the opinion that Raynaud's disease particularly, if not associated with marked changes in the vessels, gave an exceedingly good prognosis, provided the patient could be under control.

DR. HIRSCH did not think that Raynaud's disease, as such, was a sufficient diagnosis. It was only a collection of clinical symptoms which, it had been shown, might be due to various anatomical lesions—to disease of the bloodvessels, disease of the peripheral nerves, to central lesions, and, in some instances, to pure hysteria. We could not say that the prognosis was good or bad, for it depended upon the particular underlying condition.

PARÆSTHESIA OF THE EXTERNAL CUTANEOUS NERVE.

DR. HIRSCH presented a man, fifty years of age, who had had syphilis eighteen years ago, and had indulged liberally in alcohol. Two months ago, after a shipwreck and much exposure, he had arrived in this country. At the time he was wrecked, for about one hour a considerable weight had been borne by one leg, and shortly after this he had noticed a peculiar sensation on the outer side of this limb, the left, about four inches above the knee. It covered an area the size of the palm, and was never noticed at night, or while reclining or sitting. The sensation was especially aggravated by cold. It was not like any ordinary pain. According to the patient's description, it was a sort of burning sensation, or a "burning cold," as he expressed it. Examination showed no change in the electrical reaction, and no evidence of disease with the exception of a diminution of the thermal sense. The case was, therefore, a paræsthesia in the area of the external cutaneous nerve. The speaker said that a number of these cases had been reported last March by Roth, and a few days later Professor Bernard, of Berlin, had independently published several cases of this kind. A number of other cases had since been reported, and many of them had occurred in physicians. One distinguishing feature was the indefinite character of the paræsthesia, and the fact that it was never noticed when the patient was reclining or sitting. Acute infectious diseases had been mentioned in connection with the etiology of the condition. In the case presented, it was possible that syphilis and alcoholism might be considered as predisposing causes, while the prolonged pressure and the exposure at the time of the shipwreck might be looked upon as exciting causes.

TWO CASES OF TUMOR OF THE SPINAL CORD UNACCOMPANIED WITH SEVERE PAIN.

DR. PEARCE BAILEY read a paper with this title. He said that the total number of reported spinal tumors was not large; he had only been able to find 130 in all. His cases were presented merely as a contribution to a subject which merited careful observation.

The first case was a female, fifty-five years of age, who had had a good family and personal history. Last June she had been attacked with a rapid pulse and increased temperature and pain all over the body. There was also albuminuria. Death occurred sixteen days after coming under observation. The autopsy showed œdema of both lungs and marked atrophic nephritis. On the posterior and internal surface of the dura mater was a tumor, three-fourths of an inch long, one-eighth of an inch wide, and elevated about one-tenth of an inch above the surface of the membrane. It was directly opposite the posterior longitudinal fissure, was extremely hard, and finely lobulated. Microscopical examination showed a connective capsule, but the substance of the mass was subdivided by many fibrous trabeculæ. The death of the patient had been due entirely to one of the attacks of pulmonary œdema to which those suffering from Bright's disease are liable.

The second case was a female, twenty-nine years of age. No history of syphilis could be obtained. In 1889 laparotomy had been performed, and a small tumor of unknown nature removed. A second laparotomy had been done and another tumor removed some months later. Subsequently a tumor had been extirpated from the ribs, but it was impossible to obtain any history as to the nature of these growths. In 1889 she developed paralysis and numbness of all four extremities, which lasted ten months. In July, 1883, there had been another similar attack of paralysis. At this time she had also had cystitis. She was treated with strychnine and electricity, and was able after a while to walk out of the hospital. She was readmitted in 1895 with another attack of paralysis. On examination her mentality was excellent, both pupils reacted to light, but the left pupil was considerably smaller than the right; the right side of the face was pale as compared with the left; there was well-marked extensor paralysis of all four extremities. There was a moderate amount of atrophy; both knee-jerks and elbow-jerks could be elicited. There seemed to be some blunting of the tactile sensibility. The urine gave evidence of nephritis. She stated very positively that she had never been subject to any severe pain, and she certainly had no pain at the time of examination. She could move her head freely in all directions, and without any discomfort. There was no tenderness over the vertebral column. The absence of anæsthesia made the location of the tumor difficult, and her exhausted condition made operation impracticable. She died in July, 1895, from pulmonary œdema and suppression of urine. The autopsy showed extensive adhesions of the lungs and an old pulmonary

cavity. The spleen and liver were enlarged. The ureters were dilated and the kidneys showed pyelonephritis and large calcareous concretions. The brain, with the exception of atheroma of the arteries, was apparently normal. On exposing the dorsal surface of the cervical portion of the cord this appeared to be abnormally prominent, and on its removal a tumor was found, which was slightly adherent to the cord. It was an irregular, quadrilateral-shaped mass limited almost exclusively to the ventral side, and affecting the nerve-roots, one, two, three, and four on the right side, and one, two, and three on the left side. The dura itself was thickened. The cord was pressed upon anteriorly and posteriorly, causing it to bulge so that the posterior roots were considerably separated. Sections of the tumor and of the cord were made and stained and exhibited to the Society under the microscope. The tumor was found to spring directly from the external surface of the dura mater. The tumor consisted of an outer zone of fibrous tissue, inside of which was a zone of polyhedral fusiform cells. The remainder of the tumor was in a condition of cheesy degeneration. The picture was a typical one of gumma with excessive degeneration. No tubercle-bacilli were found. Above the tumor was a moderate ascending degeneration. The cord opposite the tumor was not much compressed. The anterior horns were normal as regards their shape and constituent elements. The nerve-roots, as shown in the section, presented no evidence of degeneration. An area of connective tissue surrounded the bloodvessels and apparently indicated the vascular origin of the tumor in the cord. The possible vascular origin of the process explained satisfactorily the absence of pain.

A third might be added, which had been reported in *Brain* some years ago. Here the tumor had extended from the origin of the fifth cervical to the first dorsal nerve, and lay chiefly posteriorly. The nerve-roots were compressed and atrophied, and there were the ordinary ascending and descending degenerations. The symptoms caused by the new growth had been paralysis and loss of sensation, but without the pain characteristic of spinal tumor. These symptoms had existed about three months. The absence of pain was emphasized in the report of this case. Dr. Bailey said that an attempt to account for the absence of pain in these three cases was difficult. All were of slow growth, and pressed but slightly on the cord, and two of them were yielding. The points where the pressure was applied or the rapidity of the growth seemed to be of secondary importance, and the position of the tumor with reference to the membrane appeared to influence but little the occurrence of pain. The most important factor was the consistency of the tumor—those which softened and degenerated most easily were the least liable to be accompanied by pain. His conclusions were: (1) That it was probable that tumors of the spinal cord were more frequently painless than was commonly supposed; and (2) that the pain was indicative rather of its nature than of its situation.

DR. B. SACHS said that this question of pain as a diagnostic symptom of tumor of the spinal cord had only been recently discussed before this Society. At that time he believed he had been in the minority in stating that he did not think so much stress should be laid upon this symptom as had been generally done; hence, he was glad to hear of those cases which confirmed his view. The symptom, pain, would naturally arise in those cases in which there was a very large tumor on the ventral surface actually pressing the cord against the posterior surface; it would arise still more frequently if the tumor invaded the posterior root-fibres. He would again emphasize the fact that root-symptoms were important in the earlier stages of tumor, whether they were of the sensory kind or of the atrophic order. In the majority of cases pain was, of course, present as an early symptom. In addition to the root symptoms, the next important point was that the symptoms in the majority of cases were apt to be unilateral, with a rapid involvement later of both halves of the cord; there was not that symmetry in the symptoms which was usually observed in the subacute affections of the spinal cord.

DR. LEONARD WEBER remarked that these tumors described in the paper were not tumors *of* the cord, but were *upon* the cord. In 1891 he had met in Germany a physician who had had a large experience with tumors of the spinal cord. The history of these cases showed that there had been no special pain present.

DR. C. A. HERTER thought that without doubt these extradural tumors should be classed as tumors of the spinal cord, for when they produced symptoms they did so by their influence on the cord and its nerve-roots. He also thought that it was pretty well established that extradural tumors were much less apt to produce pain than intradural tumors. The cases so well reported in the paper were certainly valuable additions to this subject. Some years ago he had gone over the subject of solid tumors of the spinal cord, and had found only twenty-six cases, three of them having been in his own practice. In several of these there had not been much pain, at least in the beginning of the disease. A possible explanation of this might be found in the fact that the origin of a tubercle was usually in the substance of the cord itself—that the tubercular process began by the deposition of tubercle-bacilli in that portion of the cord which afforded the best nutrient basis for the bacilli. In one of his cases it was quite evident how the process had extended by a narrow line of bloodvessels into the anterior horn of one side, and had subsequently extended to the white matter. It was easy to see how in a case of this kind there should be no pain. In syphilitic tumors of the cord the process was apt to originate in much closer connection with the pia mater, thus making root-symptoms, or a meningitis involving the circumference of the cord, more liable to occur. He had been impressed with the different character of the symptoms in cases of sarcoma invading the cord from without, and cases of glio-sarcoma starting from within. In the majority of cases of sarcoma of the spinal cord the process was a secondary one, and almost invariably involved the posterior nerve-roots, giving rise to intense pain. Another class of sarcomatous tumors originated about the central part of the cord, and in these there was little or no pain. The reason for the absence of pain in cases of syringomyelia was the early involvement of the sensory fibres.

THE PRESIDENT said that tumors outside of the cord-substance were more likely to cause pain, unless they were extradural; but a tumor within the cord, unless so large as to compress the nerves, could hardly be expected to cause pain. Again, in cases of tumor outside

of the cord the pain was usually of a shooting character, and followed the course of the nerve irritated. The explanation of the absence of pain in the cases recorded in the paper appeared to be due rather to the situation than to the nature of the tumor.

TWO SPECIMENS OF BRAIN-TUMOR, WITH REMARKS ON THE DIFFICULTY OF DIAGNOSIS.

THE PRESIDENT presented a pathological specimen removed from a laborer, fifty-six years of age, who gave a history of an injury to the head when twelve years of age. As a result of this there had been during his boyhood repeated *slight* attacks of epilepsy. Four years previous to his death he had received another injury to the side of the head, and two years later had begun to have definite localized convulsive seizures on the left side of the body. They always commenced with a sensation in the left hand of slight tingling or numbness. This would be followed by a full convulsion involving the left hand and arm, and sometimes the leg. These attacks recurred at intervals of two or three weeks. He had no pain, and gave no history of disturbed vision, and the ophthalmoscope showed no optic neutritis. The only other symptom was a slight paresis on the left side, lasting only a few days, after each epileptic seizure. On examination the gross strength was good; there was some loss of muscular sense; there was some ataxia in the left hand and exaggerated reflexes, particularly of the left patella. There had been no headache. In June, 1895, an ordinary trephine-opening was made, and some adhesions between the dura and skull were found. The attacks ceased for some time after the operation, but when seen by the speaker last October these attacks had returned. A diagnosis had been made of a localized lesion, probably due to pachymeningitis following a trauma and involving the hand-centre. An operation was therefore performed by Dr. Stimson. The dura was found adherent, as had been expected. The operation was attended by much hemorrhage, and followed by great shock, and in a few hours death ensued. At the autopsy a large sarcoma was found, involving the leg-centre and a portion of the arm-centre, and extending a considerable distance back into the parietal lobe.

The second specimen had been removed from a boy, eighteen years of age, having a negative family history. For two years previous to his death he had complained of more or less headache. His gait had been uncertain and staggering, but in no particular direction. He complained of considerable continuous headache. For the last year he had complained of loss of vision. Examination showed optic neuritis and optic atrophy, and the boy was almost blind. There had been no convulsions during this time, but there was a history of one or two attacks of vomiting at long intervals. A diagnosis had been made of tumor of the cerebellum, localized on the left side because of the deafness on the left side, a very slight facial paralysis, and the loss of sensation on the left side. Two or three days before death there were several convulsions with vomiting, and he died in coma. There was at no time any mental dulness or apathy. The autopsy showed, according to the report of Dr. Warren Coleman, a large single cyst containing 73 c.c. of slightly turbid, straw-colored liquid, which had not been coagulated by the formalin, though the cyst-wall was very thin over its upper part. The growth was situated in the left hemisphere of the cerebellum. The liquid apparently contained no albumin, as it did not coagulate on the addition of the commercial formalin or on the application of heat. It did contain mucus. Examined microscopically, the liquid was found to contain an abundance of old blood-cells, well hardened, a moderate number of protoplasmic mononucleated cells, apparently leucocytes, whose proto plasm was filled with highly refracting globules and larger flat cells, mononucleated, resembling endothelium. Strings of mucus were found in abundance. The liquid contained something which turned Fehling's solution a rich purple, and which threw down a red sediment after twenty-four hours. The growth was a glioma.

DR. SACHS referred to a case, seen many years ago, in which there had been attacks of hemiplegia and intense frontal headache. A diagnosis had been made of gumma, but the autopsy had shown a glioma very much like that presented. All the symptoms had disappeared for about four months under the use of antisyphilitic treatment.

DR. L. STIEGLITZ said that the first case reminded him of one operated upon about a year ago in which a gliosarcoma had been found. In this case there had been very few symptoms present for months. One very valuable symptom had been the exquisite tenderness to tapping the skull. He believed that this symptom could have been elicited in the case just reported because of the presence of adhesions. It was unfortunate that in the first operation the attending surgeon had made the trephine-opening so small—altogether too small to admit of proper exploration. The second case closely corresponded to one he intended soon to report, in which there had been deafness on one side. The case also brought out the malignity of many tumors of the brain.

DR. HERTER remarked that the long duration of the condition in the first case was a point to be considered in connection with the presence of such few symptoms.

SPECIMEN SHOWING MULTIPLE GROWTHS IN THE BRAIN OF A CHILD.

DR. JOSEPH COLLINS presented a specimen from a child who had presented a condition similar to that formerly described in the books as spurious hydrocephalus. The patient was admitted to Dr. H. D. Chapin's wards in the Post-Graduate Hospital, and the diagnosis of tumors of the brain pressing on the third ventricle was made: one situated near the posterior commissure, one pressing against the head of the nucleus caudatus, while another seemed to include the left anterior quadrigeminal body. Microscopical section of the new growths showed them to be tuberculous. On the inferior surface of the cerebrum was a new growth about the size of an American walnut, and on opening the brain four other growths were found.

DR. C. L. DANA described the clinical history of this case. He said that the child was about two years old, and had been perfectly well up to last August, when there had been a sharp attack of diarrhœa. After this the child became sleepy, and remained all the time with the eyelids closed. The was no paralysis, and no pain and no convulsions. About three months later he had examined the child. At that time it was cataleptic; there were no paralyses; no sensory symptoms; it could

hear and could swallow; there were double ptosis and slight nystagmus; there was no ophthalmoplegia except the double ptosis. The hebetude deepened, but there were no convulsions. The child died in the latter part of December. The speaker said that he had tapped the spinal cord in this case and removed two drachms of clear fluid which, on examination, showed no evidence of tubercle-bacilli. The autopsy showed these multiple tubercular tumors. He had made the diagnosis of tumor of the midbrain. He believed that most of the symptoms were due to the growth involving the corpora quadrigemina. He had been particularly interested in this marked somnolence in cases in which there was pressure on the third ventricle or on the corpora quadrigemina.

DR. SACHS said that there was a marked resemblance between this case and one reported by him in an article on disease of the midbrain region. In the case referred to, there had been an increased apathy, but owing to its tubercular nature he had attributed this to the stage of the disease. He had been surprised to find also in his case several tumors in the cerebellum as well as a tumor in the midbrain region.

DR. W. B. NOYES presented a specimen removed from a man who four years ago had been crushed between two cars. The pressure had been exerted at about the level of the first lumbar vertebra. No paralysis or fracture had resulted, but he had suffered from shock, and had been confined to bed for two months. About one year ago he had had an apoplectiform attack, characterized by blindness and deafness and paralysis of both legs, lasting for twenty-four hours. When seen by the speaker, three weeks ago, there had been spastic paraplegia, marked ataxia, increased knee-jerk and ankle-clonus, great tenderness all over the body, but especially in the head. A diagnosis had been made of brain-tumor. Death occurred from a sudden paralysis of respiration. The autopsy showed an endothelioma of the dura mater occupying the place of the occipital lobe. The tumor was irregularly kidney-shaped, with its broadest diameter from side to side. Its weight was 300 grammes. It was hard, nodular, and did not infiltrate the brain-tissue. The spinal cord was examined, but nothing abnormal found.

MEDICAL SOCIETY OF THE STATE OF NEW YORK.

Ninetieth Annual Meeting, Held in Albany, January 28, 29, and 30, 1896.

(By Telegraph to THE MEDICAL NEWS.)

THE Ninetieth Annual Meeting of the Medical Society of the State of New York was held in Albany, January 28, 29, and 30, 1896, ROSWELL PARK, M.D., of Buffalo, President, in the chair.

FIRST DAY—JANUARY 28TH.

THE PRESIDENT in his inaugural address referred to the revival of the *Index Medicus*, the advantage to the profession of the valuable collection of books known as the medical department of the State Library, and to other topics of general interest. He referred particularly to a recent court-decision by which a physician, when bringing suit for services, was debarred from disclosing the nature of such service.

The first paper was a note on the

USE OF PERMANGANATE OF POTASSIUM IN DISEASES OF THE SKIN.

DR. L. DUNCAN BULKLEY, of New York, said that he had found accidentally from a patient that a 1 or 2 per cent. solution of permanganate was an excellent local application to relieve pruritus. It produced a brown stain lasting some time, and by its oxidizing action caused a marked reduction in the thickness of patches of diseased skin.

WATER AND ITS RELATION TO DISEASE.

The discussion was opened by DR. W. P. MASON, of Troy. He said that peaty water or water from low-lying lands sometimes caused mild diarrhœa; but as yet little was known as to its relation to disease. He quoted as an example of the disastrous effects of an impure water-supply a severe epidemic of cholera occurring at Messina, Sicily. The water-supply was found to have been contaminated by the washing of clothing, and also by the close relation of the sewers and water-mains, both being of unglazed material. By prohibiting the use of this contaminated water and substituting pure water from another source the epidemic collapsed as if by magic. Observations both in England and in this country showed that typhoid fever frequently followed heavy rains when they succeeded spells of drought. He then considered the question of whether it paid to have a pure water-supply, assuming the value of a human life to be, as had been conservatively stated by E. F. Smith, two thousand dollars, and, computing the loss of time in the cases that recovered, he concluded that the total yearly loss to the city of Albany alone was practically equivalent to a tax of two hundred thousand dollars.

DR. LEWIS PILCHER, of Brooklyn, in the discussion, said he considered it an opportune occasion to refer to a bill now before the Legislature relative to the cutting of ice in rivers. The Legislature had requested the opinion of the Society on this matter, and the matter had been referred to the Committee on Hygiene. He desired now to present the report of the Committee, viz.: "That it was the opinion of the Committee that it was perfectly proper to allow ice to be cut from rivers under certain reasonable restrictions." This opinion was based on the well-known self-purification of running streams. The bill proposed very unwisely, it was thought, to prohibit absolutely cutting of ice from all rivers.

DR. A. JACOBI, of New York, heartily approved of the Committee's report, for it should be remembered that in addition to this self-purification alluded to, foreign matter contained in water was constantly sinking as the ice was being formed at the surface.

DR. V. R. MERRILL referred to a sudden outbreak of typhoid fever this winter in the Chemung Valley, after some of the ice had already been cut and stored for use in the following summer. As the typhoid bacilli had been readily detected in the river-water, the question naturally arose as to the probability of this ice having also been contaminated.

DR. M. A. CROCKETT, of Buffalo, read a paper on

SEPSIS OF THE NEWBORN.

Prognosis in these cases was most unfavorable when gastro-intestinal disorder was one of the prominent evi-

dences of sepsis. There were three cases reported, and statistics were given from a large series of cases, showing the advantages of the careful and systematic aseptic dressing of the umbilicus.

DR. A. JACOBI emphasized the skin, mouth, and anus as frequent paths of infections. The liquor amnii was a common source of infection. Slight denudations of the mucous membrane in the mouth of the newborn afforded easy means of access to micro-organisms.

DR. CHARLES JEWETT, of Brooklyn, said he had never seen a case of sepsis in the newborn in which the infection had occurred through any other channel than the umbilicus.

DR. CHARLES JEWETT, of Brooklyn, read a paper on

THE QUESTION OF PUERPERAL SELF-INFECTION.

Many careful and distinguished observers were quoted as opposed to the probability of self-infection, some of these opinions being based on the belief that the acidity of the vaginal secretion was inimical to germ-life. All childbed infection in previously healthy women was by contact. The most carefully prepared statistics showed that antepartum douching was unnecessary, if not positively harmful.

DR. A. WALTER SUITER, of Herkimer, presented

A MEDICO-LEGAL NOTE,

the object of which was to show that although it was reasonable to suppose from well-established physical laws that a bullet, owing to the heat produced by the friction of impact, could not carry infection into a wound, recent experiments of Dr. Legard, of the U. S. Army, showed that this supposition was incorrect. This observer experimented on animals with bullets infected with recent cultures of anthrax, and found that these animals died with symptoms of anthrax-infection.

DR. J. L. HEFFRON, of Syracuse, read a paper entitled

SHALL THE STATE ATTEMPT TO CONTROL THE SPREAD OF TUBERCULAR DISEASE?

which will appear in full in a later issue of THE MEDICAL NEWS.

DR. A. JACOBI said that in Europe it had been found that 28 per cent. of those afflicted with tuberculosis could be restored to usefulness, and that insurance-companies in certain countries of Europe had learned that it was cheaper for them to establish and run sanitaria for those of their policy-holders afflicted with tuberculosis than to pay the amount represented by these policies if these individuals were allowed to die.

DR. E. F. BRUSH, of Mount Vernon, said that his investigations had showed him that the only people on the face of the earth who enjoyed immunity from tuberculosis were those who did not domesticate the cow.

A discussion followed on

EARLY AND LATENT SYPHILIS IN INFANTS AND YOUNG CHILDREN.

DR. GEORGE T. ELLIOT, of New York, took up the question of hereditary syphilis. He said that the syphilitic infant might at birth be well nourished, and remain so for some weeks, and then suddenly die without having given any signs indicative of that disease. In other cases, the child would begin to lose flesh after about three months, and then present the usual evidences of syphilis. The cutaneous lesions were usually more hyperæmic and diffused than in acquired syphilis. The bullæ on the palms and soles were peculiarly characteristic, and were distinguished from simple pemphigus by the fact that the latter has no special localization, being found on all parts of the body, appearing epidemically and running a definite course in a few days. Condylomata at the corners of the mouth were also diagnostic of syphilis, as were also the bone-lesions found at the epiphysis of some of the long bones. Dactylitis, however, could not be considered pathognomonic, as tubercular lesions of a similar character were sometimes found. The deafness of hereditary syphilis, so much insisted upon by Hutchinson, usually occurred suddenly and was persistent. The well-known "Hutchinson-teeth," it should be remembered, were observed in the second set of teeth.

DR. B. SACHS, of New York, discussed the

NERVOUS MANIFESTATIONS OF SYPHILIS.

He said that syphilis of the nervous system was apt to be a cerebro-spinal affection, and might involve a small area of the brain or of the spinal cord. It might be briefly stated that cerebro-spinal syphilis was an extensive disease of slight intensity. A child with mild palsy, symptoms of cortical irritation, and imperfect speech might be reasonably considered to be suffering from cerebro-spinal syphilis. In more than two hundred cases of infantile palsies, in which Dr. Peterson and he had carefully inquired into the etiology, it had been found that only one case was due to syphilis. Among the spinal manifestations of hereditary syphilis was a spastic paraplegia, coming on late, and often associated with palsies.

DR. L. DUNCAN BULKLEY said that hereditary syphilis was not so common as formerly. Syphilitic infants should be treated at the earliest possible moment, for, as Fournier said, "Nothing is so dangerous to its surroundings as a syphilitic child." The speaker expressed the belief that the best treatment was inunction with a half-strength mercurial ointment, and this treatment, as in the adult, should be persisted in for two or three years. The syrup of the iodide of iron was a most important remedy in infantile syphilis.

DR. EDWARD D. FISHER, of New York, concurred in the opinion expressed by the last speaker regarding the treatment, except that where "mixed treatment" was employed or iodide given, he preferred to give the iodide separately from the iron. Again, it should be remembered that in the late cases the children did not always need iron.

DR. GAYLORD P. CLARK, of Syracuse, read a paper on

THE EQUILIBRIUM-FUNCTION OF THE EAR,

in which some recent physiological investigations and the inferences from them were presented. In brief, it had been found by experiments on the dogfish that when this fish was rotated in certain planes and the ampullæ of certain semicircular canals stimulated, or their nerves divided, there resulted certain movements of the eyes and fins, indicating an effort to restore the fish to its normal resting position. Section of the nerve on one side appeared to cut off the normal impulses, and left normal impulses on the other side unbalanced, so that

the fish received the impression of being turned on one side. The author said that he had succeeded also in collecting considerable evidence going to show that the human ear functionated in a similar manner.

DR. ROBERT H. GRANDIN, of New York, read a paper on

DISEASES OF INTRAUTERINE LIFE DUE TO THE MOTHER.

He said that there was evidence to show that most of the infectious diseases could be transmitted from the mother to the fœtus, but the mode of this transmission was purely one of speculation The anatomy of the placenta showed that probably there was an interchange of material, either nutrient or toxic, in the intervillous spaces. This transmission was effected probably by transfusion or by migration of leucocytes. According to this theory, a healthy placenta only could offer an effectual barrier to the transmission of disease, but it was probable that a perfectly healthy placenta did not often exist.

DR. P. W. VAN PEYMAN, of Buffalo, present by invitation, in a paper on

ECLAMPSIA,

said that the toxins causing uræmia were varied and numerous. In eclamptics the urine had been found less toxic, while the blood-serum was more toxic than normal. Jaundiced urine was exceedingly toxic. His experience in the treatment of eclampsia with veratrum viride had been favorable, provided the pulse had been sufficiently strong to warrant the administration of this drug. Pilocarpin was too depressing in its action. In his opinion many cases of eclam psia died as the result of too heroic medication.

DR. CHARLES W. ELIOT, President of Harvard University, delivered an address on

MEDICAL EDUCATION OF THE FUTURE,

in which he compared the educational facilities of thirty years ago with those of the present day, and also with the greater requirements now demanded of the physician. He said that the old régime had demonstrated the fact that even with poor preparation for the study of medicine it was possible to turn out some very worthy and skilful physicians, but it did not follow from this that the practice was a wise one. The rapid advance in the collateral branches, particularly in the analysis of the urine, in microscopy, and in bacteriology, called for a broader education, not only after entering the medical school, but in the preliminary training. There had been greater improvements in methods of diagnosis than in treatment. The ever-advancing science of preventive medi cine charged the physician of to-day with new and very important duties which required a high degree of intelligence and training.

Thoroughly educated and competent physicians were now needed to fill public sanitary positions, positions which, it need hardly be said, should bring with them adequate compensation. Every physician should be a zealous philanthropist and missionary, and hence there should be not only a full knowledge of preventive medicine, but the physician should possess the requisite moral and intellectual powers. Such a physician could exert a most beneficial influence in checking the violent and unreasoning opposition of such people as the anti-vaccinationists and anti-vivisectionists. In order to obtain this better education demanded by the times, it was necessary that better training should be given in the years between the ages of six and twenty-one, for the four years of education at the modern medical school were already filled to overflowing. Much time was now wasted in our schools. Physicians, he said, could effect a needed reform in this direction if they were less backward about assuming positions as school trustees, where they could do away with the antiquated methods of teaching now in vogue and largely due to the long dominance in school boards of the clerical element. Johns Hopkins University had taken a most important step in the right direction, and Harvard had already announced her intention of following, *i. e.*, the requirement of a degree in arts, philosophy, or medicine of those entering the medical school.

(To be continued.)

REVIEWS.

OUTLINES OF PRACTICAL PHYSIOLOGY, BEING A MANUAL FOR THE PHYSIOLOGICAL LABORATORY INCLUDING CHEMICAL AND EXPERIMENTAL PHYSIOLOGY, WITH REFERENCE TO PRACTICAL MEDICINE. By WILLIAM STIRLING, M.D., Sc.D., Brackenburg Professor of Physiology and Histology in the Owens College, and Professor in Victoria University, Manchester, etc. Third edition, revised and enlarged, with 209 illustrations. Philadelphia: P. Blakiston, Son & Co.

THE well-known *Outlines of Practical Physiology*, compiled by Professor Stirling, for the most part from the standard works on physiologic chemistry and experimental physiology, has reached a third edition and appears in a revised and enlarged form. The success which this book has met with not only in England, but in this country as well, is sufficient proof of its merits as a convenient and satisfactory guide in laboratory-work. The methods for the investigation of the chemic composition and properties of the fluids and solids of the body are clearly and tersely described and adapted for relatively inexpensive chemic apparatus. The same holds true with reference to the methods for performing the fundamental experiments illustrating the physiology of the nervous system and special senses. Some of the experiments detailed here require, however, for their repetition very elaborate apparatus, to be found only in well-equipped laboratories. Every student, however, who is entering on the study of physiology should possess a copy of this manual and repeat, as far as possible, the experiments here detailed. Physicians will find, in a convenient form, all the best methods for the examination of the blood, urine, and secretion generally.

A TEXT-BOOK OF FORSENIC MEDICINE AND TOXICOLOGY. By ARTHUR P. LUFF, M.D., Lecturer on Medical Jurisprudence and Toxicology in St. Mary's Hospital. In two volumes, small 8vo. Vol. I. 416 pages. Vol. II. 334 pages and index. London and New York: Longmans, Green & Co.

THIS is a compact and useful compendium of medical jurisprudence and toxicology. It is illustrated with twelve full-page plates and fifty-seven figures in the text. One of the plates, representing various blood-spectra, is in colors. All the illustrations are well executed and the general typography is excellent.

The matter of the book is well selected and arranged, and follows the usual order of treatises of this character. The toxicology covers over three hundred pages, being all included in the first volume. This is not an undue proportion for so important a subject. Experience in this country shows that physicians are more liable to err in the diagnosis of cases of poisoning, or, at least, to mistake them for disease, than in almost any other field of work. We are glad to note that a considerable space is given to Reinsch's test for arsenic. The ingenious method described for securing the crystalline sublimate on the surface of a glass slip, so that it can be examined under the microscope, will be of much use. Dr. Luff does not think it possible to determine from the measurements of the corpuscles that the blood was positively human blood, but thinks that it is only safe to say that it is mammalian blood. This is a wise and conservative view. Much injury has been done to the cause of expert testimony by the readiness of certain experts to testify positively in this and similar cases in which positiveness cannot be attained.

The treatment of all the topics seems to be excellently proportioned and we consider the work to be a most valuable addition to the literature of the subject.

THE DISEASES OF CHILDREN'S TEETH: THEIR PREVENTION AND TREATMENT. A MANUAL FOR MEDICAL PRACTITIONERS AND STUDENTS. By R. DENISON PEDLEY, M.R.C.S., L.D.S. Eng., F.R.C.S. Edin., Dental Surgeon to the Evelina Hospital for Sick Children, London. J. P. Segg & Co., London; S. S. White Dental Mfg. Co., Philadelphia.

As the title-page indicates, this manual is designed for medical practitioners and students, and as such it presents in clear and readable form just the information that is needed in order to understand and treat the ordinary conditions affecting the teeth of children. The contents include chapters on Structure, Eruption, Caries, Palpitis, Periodontitis and its Sequelæ, Irregularities of the Teeth, the Hygiene of the Mouth, and Treatment. The chapter on Oral Hygiene is admirable, and is thoroughly abreast of the modern pathology. Under "Treatment," mechanical and operative procedures naturally are but slightly discussed, but their principles are clearly outlined, and in cases of necessity could be satisfactorily applied by any medical man. Indeed, the author's work is so practical in its scope that dental practitioners might peruse its pages with advantage to their youthful patients. A satisfactory index closes the volume. The illustrations are numerous and add greatly to the value of the text.

ELEMENTARY TECHNIQUE IN HISTOLOGY AND BACTERIOLOGY. By ERNEST B. HOAG, A.B., B.S., Instructor in Zoölogy and Physiology, Throop Polytechnic Institute, Pasadena, Cal., and H. KAHN, Pharm. (Mich.), Assistant Demonstrator in Bacteriology, Northwestern University Medical School, Chicago. E. H. Colegron and Co., Chicago, 1895.

A COMPEND of 130 pages for beginners in histology and bacteriology, containing the various methods of staining and preparation of tissue for microscopic study. No attempt is made to introduce descriptive histology. The book is poorly printed, and for a work intended for beginners contains too many technical abbreviations. It is up to date, and will no doubt be useful to those for whom it was intended.

CORRESPONDENCE.

INFLUENCE OF SUSPENSIO-UTERI UPON PARTURITION.

To the Editor of THE MEDICAL NEWS,

SIR: Having recently had some unfortunate experience concerning the influence of suspensio-uteri upon parturition, I feel that it is highly important that this question be settled in an authoritative way as soon as possible. The only way to determine the question is by studying the actual results as seen in the practice of all operators. I will be much indebted to anyone having had a case of pregnancy following suspension of the uterus, if he will communicate the details of the case or cases to me.

Very truly yours,

CHARLES P. NOBLE.

1637 NORTH BROAD STREET, PHILADELPHIA.

THE INDEX MEDICUS.

To the Editor of THE MEDICAL NEWS,

SIR: We ask permission to announce to the subscribers to the *Index Medicus* that the January number, which comprises the literature of December and the beginning of January, is printed and will be distributed in a few days. The "back number," covering the period from May 1 to December 1, 1895, is ready for the printer, but from its extent will require some time before it can be issued.

It is proper to add that it has been found impossible to adhere to the limited number of subscribers first proposed, as subscriptions from distant points in response to applications from friends abroad still occasionally arrive. One, for example, was received to-day from Ceylon through a London friend.

J. S. BILLINGS,
ROBERT FLETCHER,
Editors of *Index Medicus*.

WASHINGTON, D. C., January 23, 1896.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF MEDICAL OFFICERS OF THE U. S. ARMY, FROM DECEMBER 31, 1895, TO JANUARY 13, 1896.

The appointment of JAMES SPRIGG WILSON to be Assistant Surgeon, with the rank of First Lieutenant, to rank from December 16, 1895, is announced. He will report in person, without delay, to the President of the Army Medical School for Instruction.

Leave of absence for six months, on account of disability, is granted Major CLARENCE EWEN, Surgeon.

Leave of absence for two months, to take effect on or about January 21, 1896, with permission to go beyond sea, is granted Major CURTIS E. MUNN, Surgeon, Benicia Barracks, California.

The leave of absence on surgeon's certificate of disability granted Major JAMES C. WORTHINGTON, Surgeon, is extended six months on account of sickness.

CHANGES IN THE MEDICAL CORPS OF THE U. S. NAVY FOR THE WEEK ENDING JANUARY 4, 1896.

January 3, Assistant Surgeons M. S. GUEST and C. P. BAGG ordered to examination for promotion.